NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

AIRTOURS: Application of an Interactive Computer Model to Analyze the Manpower Requirements and Operational Tour Opportunities of the Aviation Warfare Community

by

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December 1980

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UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) AIRTOURS: Application of an Interactive Computer Model to Analyze the Manpower Requirements and Operational Tour Opportunities of the Aviation Warfare Community		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis December 1980
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Michael Lynn Scholes		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California		12. REPORT DATE December 1980
		13. NUMBER OF PAGES 216
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) Naval Postgraduate School Monterey, California		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Manpower Planning
Officer Professional Development
Interactive Computer Model
Naval Aviation Manpower Management
Manpower Modelling

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20. Continued

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AIRTOURS: Application of an Interactive Computer Model to Analyze the Manpower Requirements and Operational Tour Opportunities of the Aviation Warfare Community

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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
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ACKNOWLEDGMENT

The author would like to thank the members of OP-13 and NMP-4, who provided assistance in the preparation of this thesis. Special thanks to CDR Steve Todd, LCDR Gary Johnson, and LCDR Ernie Morris, whose contributions were invaluable.

PREFACE

This thesis was completed as part of the Research in Officer Manpower and Personnel Planning sponsored by the Principal Deputy Assistant Secretary of the Navy (Manpower and Reserve Affairs) and the Deputy of Naval Operations (Manpower, Personnel, and Training, OP-01).

The model is now accessible to manpower managers in OP-01 using the APL*PLUS system of the Scientific Time Sharing Corporation. Potential users may readily familiarize themselves with the model by referring to Section IV and V, and accompanying appendices of this thesis.

I. INTRODUCTION

Manpower, always an important part of the national defense effort, has assumed even greater importance in recent years. During the era of the all-volunteer force, the acquisition of talented and qualified individuals has become a central issue for defense policy makers. As stated by Secretary of Defense, Harold Brown, in his Report to the Congress for Fiscal Year 1980 [Ref. 1]:

> "The overiding Defense Manpower objective is to increase combat effectiveness of the Armed Forces. In that effort, the most important factor, often taken for granted in discussions of sophisticated equipment, is attracting and retaining capable, motivated people."

The goal of increased combat effectiveness through the retention of motivated people can be achieved only if scarce manpower resources are properly managed.

"Management", in this instance, is the planning and integration of effort, judicious use of resources, motivation of people, and provision of leadership in order to guide an organization toward its goals and objective in an efficient manner [Ref. 2]. To carry out the above functions, toward the end of increased combat effectiveness, defense managers are engaged in a continuous process of making decisions; therefore management may be considered equivalent to decision making.

In the past, decision making has been considered an "art"; a talent learned only through long years of experience using a methodology of trial and error. While the concept of management as an art is still valid, decision making based solely on experience and trial and error can be very costly and inefficient in today's dynamic national defense environment.

Military manpower managers in particular are faced with a number of serious problems which require systematic analysis, rather than piecemeal proceedures dependent on trial and error methods to solve. One such problem facing manpower managers in the United States Navy is the management of the Unrestricted Line Officer (URL) corps, which has incurred serious shortages in the recent past. These shortages, which permeate most URL communities, have been caused by various internal and external factors ranging from the arduous nature of Naval sea duty, to complaints of low pay and eroding benefits, to competion from the civilian sector. While the Department of Defense has taken positive steps to stem the outflow of experienced URL officer manpower, the closed nature of the military personnel system requires that manpower managers distribute the remaining line officers in ways that contribute to the successful accomplishment of defense mission objectives, i.e., combat effectiveness.

To properly plan for effective distribution of scarce officer manpower resources in an environment as dynamic as the defense community requires the collection, organization, and analysis of a diverse and voluminous amount of information in a short amount of time [Ref. 3]. Manpower planners must have the capability to interpret and integrate this information quickly and concisely. Concurrently, they must have the capability to analyze the effect that changing policies have on distribution decisions. The application of a computerized manpower planning model could provide this capability.

Research has recently been completed at the Naval Postgraduate School on several interactive manpower models designed to enhance the decision making process of planners and analysts in all major Unrestricted Line Officer communities. Teply [Ref. 4] has developed a model for the Submarine Officer Corps, Morris [Ref. 5] provides an evaluation of career paths and a model for the VP (Maritime Patrol) Aviation Community, while Milch [Ref. 6] has developed a model for Surface Warfare Officers. All three of these models analyze sea tour opportunities in the relevant URL community modelled.

This thesis continues research in this area by focusing on a segment of the URL community which is experiencing serious manpower problems: The Aviation Warfare Community.

Aviation manpower managers are currently faced with pilot inventories which are at their lowest levels in over 30 years. In the grade of Lieutenant alone, the Navy is short 1900 pilots, or 43 per cent of authorized requirements [Ref. 3]. Aggravating the current shortfalls are pilot retention rates, which have plummeted from 62 per cent in Fiscal Year (FY) 1977, to less than 30 per cent in FY 1980. In October 1980, manpower planners in the Office of the Deputy Chief of Naval Operations, Military Personnel and Training Division (OP-13) stated:

> "The Navy's aviation officer community currently is operating at resource levels insufficient to fill all aviation officer requirements and its share of generalist billets. Although the pilot and NFO training rates are programmed for modest increases in the next few years, it will be years before the inventory can generate the total numbers and the desired year group experience mix to properly fill all these requirements. In the interim, continuing policy reviews and decisions will be required to insure that available resources are utilized in the most effective and efficient manner to meet priority fleet training, and management positions. At the same time, it will be essential that career development opportunities be maintained for the long term growth of the community and to provide retention incentives for individual officers [Ref. 7]."

It is obvious from the above statement, that aviation manpower planners are faced with a difficult situation that requires a systematic means of determining the impact of alternative management policies and actions on the viability of Naval Aviation. An interactive, computerized, manpower model of the Aviation Warfare Community could provide such a tool and enhance the capability to analyze alternative policies and decisions.

This thesis adapts the mathematical formulation and programming developed by Milch [Ref. 6] for determining the seatour opportunities of Surface Warfare Officers, to the Aviation Warfare Community. Although the Aviation Warfare Model (AIRTOURS) uses the algorithms of Milch's model, the diverse nature of the Aviation community required that specific aviation manpower requirements and officer career path criteria be developed. Several programming changes were also necessary to more accurately reflect the needs of the aviation community.

By individually modelling the operational career sequence of five different types of Aviation Warfare Officers, the AIRTOURS model determines the opportunities for an officer to obtain an operational tour position or the shortfall of operational tour positions to be fully manned. The AIRTOURS model uses several inputs to determine these opportunities. The number of aviation organizations in the future that must be manned and the number of billets per organization for each tour position, determine the manpower requirements or demand that must be met. Tour positions (the years of service necessary to be eligible to fill a billet and length of the tour in that billet), coupled with tour grade requirements and the stock of relevant officers in the future by year group and rank, are combined to determine the number of officers available to fill the

required billets. For each tour position, over future years, requirements are compared to availabilities yielding the ratio of seatour opportunities.

The power of the model lies in its ability to change input information. For instance, an analyst may want to see the effect that lengthening the first operational squadron tour has on meeting tour requirements. Similarly, he might want to determine what impact the decommissioning of an aviation squadron will have on the demand for aviation officer manpower over a series of fiscal years. The capability of the model to alter these and other input parameters permits the user to analyze various alternative allocation policies and detect unfavorable trends which may require policy alteration.

The analysis which follows briefly describes the Navy's manpower planning system, with particular attention to the Aviation Warfare Community. The parameters which effect aviation career development are then structured. A functional description of the model's computational algorithm is presented, followed by detailed instructions for model operation. The final sections of this thesis contain applications of the AIRTOURS model, including analysis of current aviation manpower data, as well as presentation of specific alterations designed to demonstrate the model's flexibility in analyzing alternative decisions.

II. THE NAVY'S OFFICER MANPOWER PLANNING SYSTEM

Examination of the Aviation Warfare community provides an excellent opportunity to observe an important segment of the Navy's Manpower planning process. Manpower planning within the aviation community is undoubtedly as intricate as any of the Navy's Unrestricted Line Officer communities.

An initial step, prior to an indepth discussion of the aviation community is to gain insight into the procedures and policies of the Navy's Manpower planning system in general.

The Chief of Naval Operations (CNO) directs and coordinates the development and implementation of the manpower planning system. The objectives of the system, as outlined in The Manual of Navy Officer and Enlisted Manpower Policies and Procedures (OPNAVINST 1000.16D) [Ref. 8] are as follows:

> Determine minimum military and civilian manpower requirements to achieve approved operational and mission demands.
>
> Provide staffing standards for functions performed ashore and afloat, based on recognized management and industrial engineering techniques and objective determinations of workload.
>
> Provide a system for the aggregation of manpower requirements information at the various levels above the activity level to support and justify Navy manpower requirements during all stages of the Planning, Programming, and Budgeting system.

Relate support manpower requirements within the shore establishment to the changing demands of the operating forces.

Minimize response time for manpower information by providing a capability to respond rapidly to management queries.

Ensure that manpower requirements for maintenance and operation of new weapons, equipments, systems, and initiatives are specified sufficiently in advance of fleet introduction to allow their consideration in the programming cycle and development of requisite personnel skill levels.

Provide reliable planning information to personnel inventory managers, both military and civilian, so they may assess the feasibility and impacts of manpower management actions.

The responsibility for ensuring that these objectives are achieved rests with several Naval organizations. Of specific interest in the discussion of the Aviation Warfare community are the Deputy Chief of Naval Operations (DCNO) for Manpower Personnel and Training (OP-01), the Commander, Naval Military Personnel Command (NMPC), and the DCNO for Air Warfare (OP-05).

The DCNO (Air Warfare) is responsible for the promulgation of the Required Operational Capability (ROC) and Projected Operational Environment (POE) statements. In the case of aviation squadrons, the ROC and the POE are utilized in the Squadron Manpower Requirements Program. The ROC provides a precise definition of the squadron's mission statements and the POE is a description of the specific operating scenario in which the squadron is expected to operate in a wartime

environment. The ROC/POE presents squadron tasking in terms of mission areas, type and quantity of aircraft, flight hour utilization, flight crew composition, and other quantified factors.

The Squadron Manpower Requirements program, which is managed by the Deputy Chief of Naval Operations (Total Force Planning), uses the statements of mission tasking provided by the ROC and POE to document manpower requirements for the Navy's aviation squadrons and publishes them in Squadron Manpower Documents [Ref. 9]. The program was initiated to provide a methodology for documenting manpower requirements in aircraft squadrons. It specifies by individual billet, the minimum quantitative and qualitative manpower requirements to support accomplishment of all assigned missions and required operational capabilities in the designated environment.

The Squadron Manpower Documents (SQMDs), in conjunction with Ship Manpower Documents (SMD) and Shore Manpower Documents (SHMD), form the basis for the Manpower Authorization (MPA) (OPNAV Form 1000/2). The MPA indicates which billets are authorized by the CNO after considering current budgetary constraints, priorities, and manpower policies. The quality assigned to each billet authorized on the MPA shall normally be the same as the corresponding billet in the appropriate manpower document [Ref. 8]. "Billet quality" in this instance refers to the grade level required to fill the billet.

Manpower requirements planning is, therefore, dependent on a multitude of complex variables. The major impetus, however, is to structure a force of the proper skill and experience mix, a force that can accomplish mission demands in a dynamic operating environment.

Nowhere is the necessity for systematic planning better evidenced than the Aviation Warfare community. This community, predominantly composed of pilots, designated 1310, and Naval Flight Officers (NFO's) designated 1320, represents approximately one-half of the Unrestricted Line Officers of the Navy.

These officers fill operational aviation billets in the various fleet aviation squadrons, direct fleet support units, and are utilized in other aviation activities such as aviation ships, research and development units, and aviation special mission activities. Similarly, these officers are required to fill training billets, both as instructors and as students, as well as numerous supervisory and staff billets within the operational force and various support activities. In addition to the aforementioned requirements which specifically demand officers with an aviation designation, naval aviators and NFO's can also be assigned to generalized billets which are non-aviation oriented. These billets have a 1000 or a 1050 designation. The Aviation Warfare community is required to fill a "fair share" of these billet types.

Comensurate with requirements planning is the equally complex and equally necessary goal of development and employment of a qualified and motivated officer corps. Inventories must be kept in line with requirements and, at the same time, the systematic professional development of individual officers within the Aviation Warfare community is essential. The closed, pyramidal structure of the military personnel system requires that new aviation resources (i.e., pilots and NFO's) be accessed only at the bottom of the structure. Lateral hiring of personnel is generally not an option available to aviation manpower planners. Thus it is necessary to "cultivate" or "grow" a knowledgeable and professionally competent officer corps that will meet aviation mission demands both at present and in the future.

The Naval Military Personnel Command is responsible for the development or "growth" of the necessary inventory in the quantity and quality to meet the manpower requirements established by the CNO. Working closely with the Director, Military Personnel and Training Division (OP-13), who has primary responsibility for the development of personnel policies and plans in support of Navy Forces, the Assistant Commander for Distribution (NMPC-4) maintains and manages the inventory of personnel through the distribution process. As described in the Commanding Officers Addendum to the URL Guidebook [Ref. 10], the mission of NMPC-4 is threefold:

> To assign the best qualified officers available to meet the needs of the Navy as defined by the approved officer billet file.

To assign officers to billets which develop their professional expertise in order that the officer corps as a whole embodies the leadership, technical, and managerial skills necessary for the Navy to achieve its mission in war or peace.

To assign officers sensitively and fairly to ensure their continued motivation and dedication to the Navy.

Therefore it is the responsibility of NMPC-4 to assign officers systematically to meet current Naval manpower requirements while concurrently maintaining an officer professional development sequence which ensures a professional and well motivated force that is able to meet future needs.

Figure 1 illustrates the professional development path of aviators as found in the Unrestricted Line Officer Guidebook [Ref. 11]. This path is not a representation of an individual officer's career. It is intended as a general guide to a sequence of billet types which aviators should experience throughout their career. It must not be applied rigidly because a career development path must be responsive to constantly changing manpower policies and requirements as well as to the needs and aspirations of individual naval aviators. The timing of specific tours must contain a degree of flexibility to enable manpower planners the ability to accomplish these multiple objectives.

For the aviator who aspires to command, certain specific tours must be served so that he attains the requisite operational expertise called for by such a demanding assignment. This expertise is gained by serving in operational

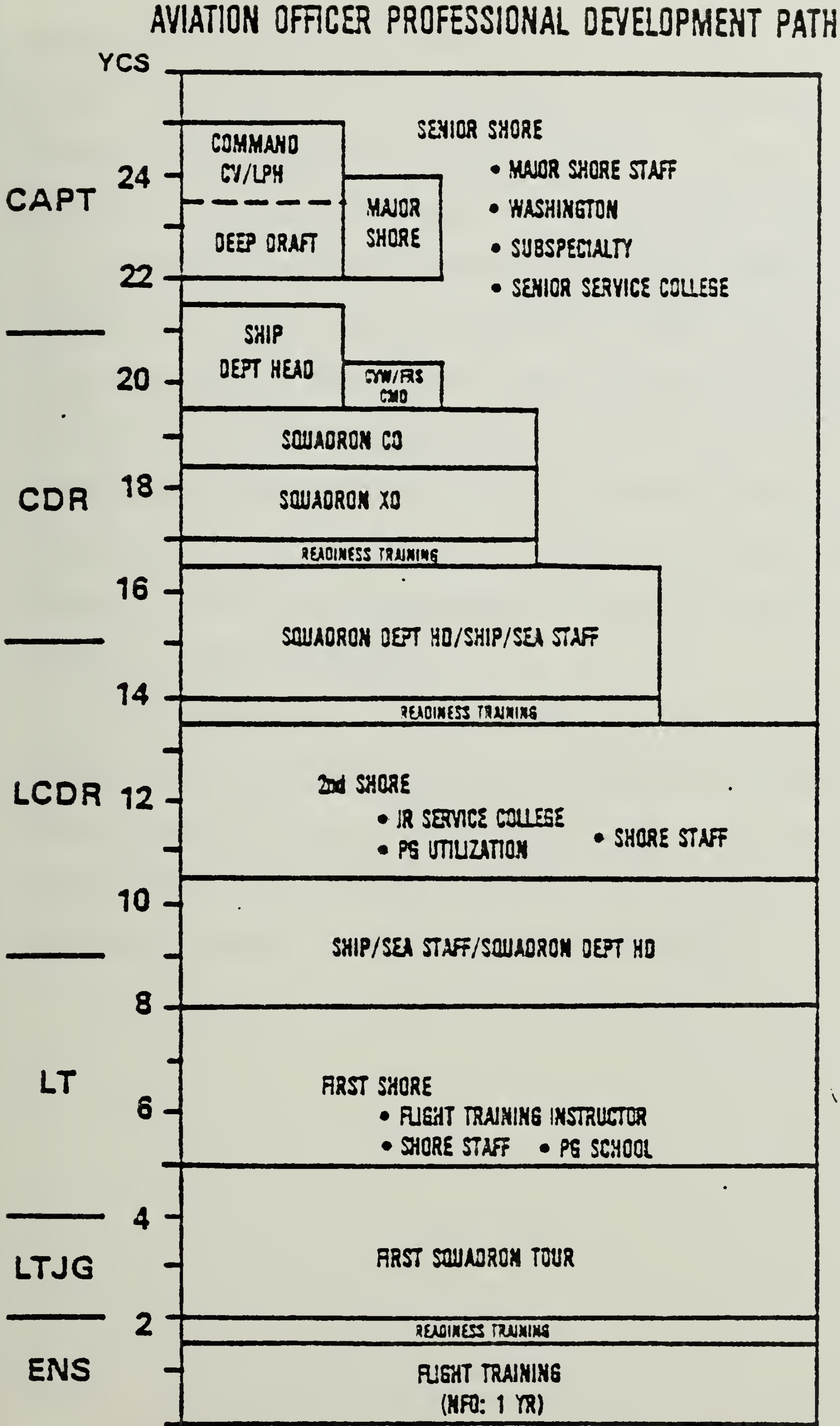
AVIATION OFFICER PROFESSIONAL DEVELOPMENT PATH
YCS
CAPT
CDR
LCDR
LT
LTJG
ENS
24
22
20
18
16
14
12
10
8
6
4
2
COMMAND CV/LPH
DEEP DRAFT
MAJOR SHORE
SENIOR SHORE
• MAJOR SHORE STAFF
• WASHINGTON
• SUBSPECIALTY
• SENIOR SERVICE COLLEGE
SHIP DEPT HEAD
CVW/FRS CMD
SQUADRON CO
SQUADRON XO
READINESS TRAINING
SQUADRON DEPT HD/SHIP/SEA STAFF
READINESS TRAINING
2nd SHORE
• JR SERVICE COLLEGE
• PG UTILIZATION
• SHORE STAFF
SHIP/SEA STAFF/SQUADRON DEPT HD
FIRST SHORE
• FLIGHT TRAINING INSTRUCTOR
• SHORE STAFF
• PG SCHOOL
FIRST SQUADRON TOUR
READINESS TRAINING
FLIGHT TRAINING
(NFO: 1 YR)

Figure 1.

billets in aviation squadrons and on aviation related ships and staffs. The Navy also has requirements for qualified aviation officers ashore. These billets are filled by officers in the shore segments of the path depicted.

Given the serious manpower shortages which the aviation community is presently experiencing [Ref. 7], it is imperative that manpower managers have the ability to effectively distribute aviation manpower in such a way that all possible requirements are met and officer professional development is assured. Accomplishment of this difficult task is enhanced by the use of management science techniques such as computer manpower models.

The following analysis develops such a model which should enable manpower planners to test alternative hypotheses regarding distribution and assignment policies, tour positioning, tour lengths, experience mix, and other manpower factors relevant to the aviation community.

III. MODEL DESCRIPTION

A. LEVEL OF SPECIFICITY

The numerous variables influencing the aviation manpower planning problem have been documented in the previous chapter. While aviation manpower management is complex, it is also constrained by certain rules which tend to give structure to the overall system. An example of a specific rule which helps structure the manpower planning process is the Aviation Officer Professional Development Path depicted in Figure 1. Although this path is flexible, it is sufficiently structured to be used as a guide and tool in implementing aviation assignments. Structure enables the use of mathematical modelling techniques for simulating aviation manpower systems.

A model is a simplified representation or abstraction of reality. It is simplified because reality is too complex to copy exactly and because much of the complexity is actually irrelevant to the specific problem [Ref. 2]. Although a model is a simplified version of reality, care must be taken to ensure that the model is valid; that is, that the model sufficiently represents the problem being modelled. If the set of assumptions and equations inherent in a mathematical model does not adequately represent the relationships which occur in the problem being studied, the

model will be of no use. If, however, the model is cluttered with relationships and assumptions designed to simulate all conceivable variations within a particular problem, the model will soon become cumbersome and unmanageable. It is necessary to find a proper balance between the level of simplification of the model and the representation of reality. The model will then have the potential to be a useful problem solving tool capable of aiding and supporting the manager's decision making process.

B. AVIATION PARAMETERS

The primary goal of the AIRTOURS model developed in this thesis, is to provide manpower planners with an interactive computer capability for rapid and easy determination of the impacts of alternative management policies and actions. To enable attainment of this goal, it was necessary to conduct an indepth analysis of the Aviation Warfare community. The purpose of this analysis was to define the unique parameters which affect officer career patterns and manpower requirements within the community.

The analysis was accomplished by extracting relevant information from the Officer Master Billet File (OMBF), through assistance from Manpower analysts in the Naval Military Personnel Command and in the Manpower Personnel/Training (MPT) Division (OP-13) of the Office of the Deputy Chief of Naval Operations, and by examination of pertinent manpower publications.

1. <u>Aviation Subcategories</u>

Analysis of billet qualitative requirements as reflected in the Manpower Authorization (MPA) (OPNAV Form 1000/2) and the Officer Master Billet File demonstrated the need to make certain changes in the AIRTOURS model vis á vis Milch's SWOTOURS model. Qualitative requirements for officer billets are identified in the MPA by designation, grade, descriptive billet title, Navy Officer Billet Classification Code (NOBC), and, when appropriate, by a Subspecialty code and an Additional Qualification Designation Code (AQD) [Ref. 12].

The diverse nature of the Aviation Warfare specialty requires that a billet incumbent possess the proper designator code, identifying the officer as either a pilot or Naval Flight Officer (NFO); additionally, virtually every aviation warfare billet specifies an AQD which identifies the type aircraft in which the officer must be qualified. Discussions with aviation detailers and placement officers in NMPC-4 also revealed that the Aviation Officer Professional Development path differed significantly for different types of Aviation Warfare Officers. For example, in the Jet community, Naval Flight Officers commence their initial squadron tour as much as one year prior, measured in years of commissioned service (YCS), to pilots in the same community. This tour start variability is caused by different training pipeline lengths. Similarily, commencement of the squadron department head tour varies significantly

among the various aviation subcommunities. Jet pilots have started the department head tour as early as the 10th YCS, while prop pilots normally do not serve in that billet until the 12th or 13th YCS. Due to the existence of these manpower requirements and career development inconsistencies among the various aviation warfare communities, aggregation of the inventory and requirements information into a single officer category was deemed inappropriate and of insufficient detail to produce meaningful results. It was found expedient to classify the aviation community into the following five subcommunities, reflecting general aircraft type requirements and aviation designators:

PROP PILOT

PROP NFO

JET PILOT

JET NFO

HELO PILOT

These classifications contain sufficient detail for meaningful analysis of the Aviation Warfare community while concurrently allowing the program to remain interactive. A more detailed level of data aggregation (i.e., P-3 pilot community, F-14 NFO community, etc.), while considered useful, was not undertaken because the relevant officer inventory information presently available was considered too incomplete for useful analysis at this level.

The five aviation subcommunities having been determined, it was then necessary to identify the relevant tours, organizations, command categories, and billets that represent the requirements structure for those subcommunities.

2. Tour Positions

Every aviation billet examined had, as one of its variables, a Tour Position Indication Code (TPIC). The TPIC indicated the approximate career point or experience level at which a billet was normally encountered by an officer. TPIC classification was selected for inclusion in the AIRTOURS model since it reflects the shape and composition of the aviation community requirements pyramid and is the only billet information available that reflects time.

Identification of aviation billet TPIC classifications was a computer generated process that assigned an alpha-numeric code to every aviation billet in the Officer Master Billet File. Determination of the proper code was based on Activity Mission Code (AMC), Primary Naval Officer Billet Classification (PNOBC), Utilization Code (UCODE), billet grade, billet designator, and Unit Identification Code (UIC). Output from the TPIC generation program revealed that aviation TPIC's were divided into two general groups. The first, and most significant group consisted of TPIC's A through I and their subcategories (i.e., A, A1, A2, B, B1, etc.). These billets represented hard sea and shore requirements. The second group consisted of TPIC's U through

Z, representing individual account billets primarily composed of student and transient officer requirements. In total, 64 individual TPIC's were identified. Inclusion of all TPIC's in the AIRTOURS model would have restricted the interactive capability of the model; it was determined, therefore, to limit the analysis to operational aviation tours and aviation command tours.

An operational tour is defined as any tour which is considered sea duty, sea duty equivalent, or which generally occurs at a career point which coincides with tours which are considered sea duty or sea duty equivalents. An example of this last situation occurs in certain Fleet Support squadrons which are considered shore duty but contain billet requirements for pilots and NFO's at career points which coincide with traditional sea duty tours. The aviation command tours are those which require the incumbent to have been selected by a formal command screen board.

Fifteen separate TPIC's were identified as representing the relevant operational and command tours that an aviation officer would most likely encounter during a career.

Figure 2 illustrates the 15 tours chosen for inclusion in the AIRTOURS model. Each tour position represents the years of commissioned service (YCS) required to become eligible for the billets within the tour as well as the average length of the tour while serving in those billets.

Appendix A contains a complete list of the tours represented by the 15 TPIC's, including the billet qualitative requirements of each tour.

In general, the tours selected reflect a more detailed presentation of the operational and command portion of the Aviation Officer Professional Development path depicted in Figure 1. This added detail permits a more precise analysis of manpower requirements within the five aviation subcommunities.

3. Organizations

Determination of the relevant aviation organizations necessary for inclusion in the AIRTOURS model was accomplished by generating a computerized list, using sort routines outlined in the Statistical Package for the Social Sciences [Ref. 13], consisting of all naval organizations (i.e., squadrons, ships, staffs, etc.) that had manpower requirements for Aviation Warfare Officers. This list was then manually screened to select only operational organizations which, in this case, are defined as any organization with billet requirements for aviation officers in the operational and command tours specified in Section III.2.

The operational organizations list identified over 250 separate Naval organizations representing all the Navy's TACAIR, ASW, and Force Support Squadrons, as well as Direct Fleet Support units (NAS, NAF, ASWOC, etc.), aviation ships (CV, CVN, LPH, etc.), major afloat staffs (CVW, CARGRU,

AVIATION WARFARE OPERATIONAL TOURS

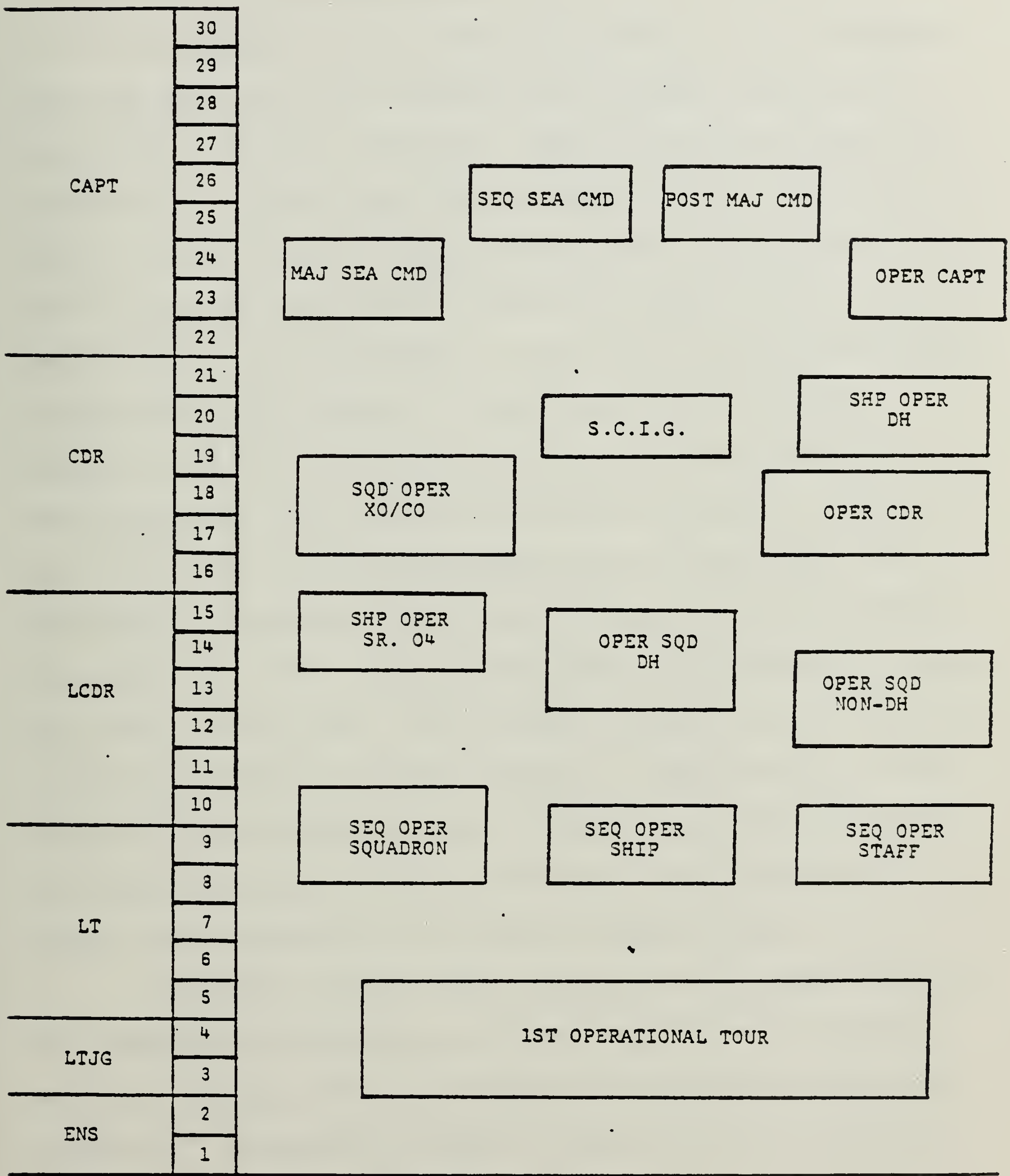

Figure 2.

CRUDESGRU), numbered fleet staffs, and several other smaller aviation units with requirements for aviation officers. It was determined that the detail provided by this ponderous list was more than was necessary for accurate analysis of the Aviation Warfare community. Thus, it was necessary to condense this operational organization list by combining under a single title or organization name, all organizations which contained the same, or nearly the same, billet requirement structures. For example, examination of relevant SQMD's revealed that all twenty four Maritime Patrol Squadrons operated nine P-3 aircraft and consequently required the same quantities and qualities of pilots and NFO's. Therefore, since the billet requirements were essentially the same, the 24 squadrons were defined under a single organization name, i.e., VP. It was found that all TACAIR (VAL, VAM, VAQ, VAW, VF) and ASW (VS, HS, HSL, as well as VP) squadrons could be defined in a similar manner. Additionally, it was found that major afloat staffs, ASWOC's, and most aviation ship types contained billet structures similar enough to permit their designation as single organizations.

Aircraft carriers (CV) proved to be an exception, in that manpower requirements differed significantly enough among the various CV's to necessitate aggregation into four separate CV categories. These categories and the aircraft carriers contained in them are as follows:

AVT   AVT 16 - Lexington

CV1	CV 41	- Midway
	CV 43	- Coral Sea
CV2	CV 59	- Forrestal
	CV 60	- Saratoga
	CV 61	- Ranger
	CV 62	- Independance
	CV 63	- Kitty Hawk
	CV 64	- Constellation
	CVN 65	- Enterprise
	CV 66	- America
	CV 67	- John F. Kennedy
CVN	CVN 68	- Nimitz
	CVN 69	- Dwight D. Eisenhower
	CVN 70	- Carl Vinson

The remaining organizations chosen including Fleet Support Squadrons, overseas naval air stations, numbered fleets, and the other smaller aviation organizations contained unique billet requirements which necessitated defining them as separate organizations. Appendix B contains the organizations by subcommunity selected for use in the AIRTOURS model. Also displayed are the projected number of these organizations for the next six fiscal years.

4. Command Categories

The need to define command categories among the organizations to be considered was caused by the fact that a great many important opportunities for aviation command occur in organizations which are not considered operational duty as defined in Section III.B.2. For example, Aviation Training Squadrons (TRARONS) and Fleet Replacement Squadrons (FRS), although considered shore duty, represent a significant number of aviation command and sequential command in

grade (SCIG) opportunities for aviation officers in the grade of Commander. Since the units included on the organization list outlined in Section III.B.3 comprised only operational organizations, many aviation command opportunities were excluded. Inclusion of these commands in the AIRTOURS model was considered useful since it would give manpower planners the ability to more fully analyze aviation command opportunities. This ability was deemed important since opportunity to command is such a vital element of aviation officer career development and since many officers view aviation command as their ultimate goal. Additionally, exclusion of a significant number of command opportunities from the AIRTOURS model would have produced misleading results. However, inclusion of all relevant shore organizations simply to enable model accuracy in these tours would have hampered the interactive capability of the model and was therefore deemed inappropriate. Consequently, four command categories were created for the purpose of maintaining model precision, minimizing data input and refining the ability to analyze command opportunity. The four command categories and the organizations they represent are as follows:

1. TRARON XO/CO - Aviation Training Squadrons.
2. FRS CO - Fleet Replacement Squadrons (RAGS)
3. MAJOR COMMAND -
   18 - Service Force Ships
   7 - Amphibious Ships
   7 - LPHs
   4 - Patrol Air Wings

4. SEQUENTIAL COMMAND - Sequential sea commands not detailed previously by the organization list. Specifically two LHSs, four PHIBRONS, and three SERVRONS.

These categories are included on the aviation subcommunity organization lists contained in Appendix B. Obviously, since these are categorical representations of several organizations, the quantity by fiscal years, as illustrated in Appendix B, should always remain at one (1).

5. Billet Requirements

Billet requirements information for the specific aviation organizations, command categories, and tour positions delineated earlier were manually compiled and catalogued again using the OMBF as the source document. Billet designator and AQD requirements necessitated the compilation of 10 separate files of billet requirement data. Five of the files were composed of discrete billet requirements for each of the aviation subcommunities. A billet was considered a discrete requirement if the billet AQD code and designator specifically identified the billet as requiring a prop pilot, prop NFO, jet pilot, jet NFO, or helo pilot. If the billet in question contained insufficient qualitative information or allowed variability in either designator or AQD requirements, it was classified into one of five nondiscrete billet files. Nondiscrete files are categorized as follows:

Nondiscrete prop - This file contains billets which require prop aviation officers, but contain no specific designator requirement. That is, either a pilot or a NFO is considered eligible to fill the requirement.

Nondiscrete jet - This file contains billets which require jet aviation officers, but contain no specific designator requirement; i.e., either a pilot or a NFO is considered eligible to fill the requirement.

Nondiscrete pilot - This file contains billets which require pilots, but contain non-specific AQD requirements; i.e., either prop, jet, or helo pilots are considered eligible to fill the requirements.

Nondiscrete NFO - This file contains billets which require NFO's, but contain no specific AQD requirements; i.e., any prop or jet NFO is considered eligible to fill the requirements.

Nondiscrete aviation - This file contains billets which contain no specific designator and AQD requirements; i.e., any aviation warfare officer is eligible to fill the requirement.

The discrete billet files describe those billets which are subcommunity specific while the nondiscrete files represent billets which may be filled by more than one subcommunity of aviators. The total number of billets for which any specific subcommunity of aviators is eligible is the sum of the number of discrete billets plus a portion of those nondiscrete billets which are applicable to that subcommunity. As an example, Table 1 illustrates the discrete billet requirements matrix for the prop pilot subcommunity. The billet requirements are defined by aviation organization or command category and by tour. These requirements are specific billets which may be filled only by prop pilots. Table 2, on the other hand, contains the nondiscrete billet files associated with the prop pilot subcommunity. These files, while they are specific requirements for the class of

Table 1

NUMBER OF DISCRETE PROP&PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VP	30	1			2	2			1						
2.	VAW(E2B)	9				2	1			1						
3.	VAW(E2C)	7				1	1			1						
4.	VQ1	16	2			3				1						
5.	VQ2	20	2			2	2			1						
6.	VQ3	17	12			1	2			1						
7.	VQ4	34	10			3	2			1						
8.	VC1(VR DET)	3	3			2										
9.	VC2	1								2						
10.	VC3	6				1	3			2						
12.	VC8	8				1	3			2						
13.	VR24	25				8	8		2	2						
14.	VRC30	15	4			2	1			1						
15.	VRC40	17	4			1	2			2						
16.	VRC50	17	15			1	1			1						
17.	VXE6	8	9			1	1			1						
18.	VXN8	11	1			1	1			1						
19.	VP(SPEC DET)				7											
25.	CV 1			4				1	1							
26.	CV 2			4				1								
27.	CVN			4				1	2							
30.	ASWOC				2											
32.	6TH FLEET				1											
33.	7TH FLEET				1											
34.	PACMISRANFAC				4											
35.	NAS GTMO BAY				5											
36.	NAF SIGONELLA	5			14											
37.	NS KEFLAVIK				4											
38.	NAS CUBI POINT	3			8											
39.	NAS AGANA	3			3											
40.	NAF MISAWA				5											
42.	OTHERS				5											
43.	TRARON XO/CO									10						

Table 2

Nondiscrete Billets Associated
With the Prop Pilot Subcommunity

NUMBER OF NON-DISCRETE PROP OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
20.	TACRON 1				7											
25.	CV 1											1				
26.	CV 2											1				
28.	CRUDESGRU				1											
31.	2ND FLEET								1							
32.	6TH FLEET												1			
41.	NS ADAK				3											
42.	OTHERS				4											
43.	TRARON XO/CO									1						
44.	PRS CO										4					
45.	MAJOR CMDS													7		
46.	SEQUENTIAL CMDS														3	

NUMBER OF NON-DISCRETE PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
14.	VC6	3								1						
23.	AVT			8				2	1			1				
24.	CV1			1					1							
25.	CV2			1				1								
26.	CVW			2					2							
33.	NAS GTMO BAY	1			2											
34.	NS KEFLAVIK				1											
40.	OTHERS				1											
41.	TRARON XO/CO									2						

NUMBER OF NON-DISCRETE AVIATION OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
14.	VC6					2										
18.	TACRON 1					4				1						
19.	TACRON 21/22					3				2						
21.	LPH										1					
24.	CV1										1	3				
27.	CRUDESGRU															1
28.	CARGRU								1							
30.	2ND FLEET									1						
37.	NS ADAK				2											
40.	OTHERS				5											
42.	PRS CO										1					
43.	MAJOR CMDS													11		
44.	SEQUENTIAL CMDS														3	

aviation officers they represent (prop aviators, pilots, etc.), do not necessarily represent the number of prop pilots required to fill them. The nondiscrete billet requirements must be shared among the subcommunities for which they are relevant. It was necessary, therefore, to devise a systematic means of sharing or apportioning the nondiscrete billets.

Several apportionment schemes were investigated, but all had drawbacks of one type or another. After several discussions with manpower analysts in OP-13, it was decided to apportion the nondiscrete billets based on an algorithm which computed apportionment ratios for each tour. These apportionment ratios were based on the average inventory of officers available for a specific tour as defined by YCS and grade. Different apportionment ratios are associated with each of the nondiscrete billet files. For instance, to determine the total number of billets (b(apportioned)) which should be assigned to the prop pilot subcommunity in any specific tour, the model uses the following apportionment formula:

$$\begin{aligned} b(\text{apportioned}) = {} & b(\text{discrete prop pilot}) \\ & + \frac{N_1}{N_1+N_2}\, b(\text{nondiscrete prop}) \\ & + \frac{N_1}{N_1+N_5+N_3}\, b(\text{nondiscrete pilot}) \\ & + \frac{N_1}{N}\, b(\text{nondiscrete aviator}) \end{aligned}$$

where:

b(discrete prop pilot) = the number of discrete prop pilot billets for the applicable tour

b(nondiscrete prop) = the number of nondiscrete prop community billets for the applicable tour

b(nondiscrete pilot) = the number of nondiscrete pilot billets for the applicable tour

b(nondiscrete aviator) = the number of nondiscrete aviator billets for the applicable tour

and where:

N_1 = the average number of prop pilot officers eligible to fill the specified tour's billet requirements

N_2 = the average number of prop NFOs eligible to fill the specified tour's billet requirements

N_3 = the average number of jet pilots eligible to fill the specified tour's billet requirements

N_4 = the average number of jet NFOs eligible to fill the specified tour's billet requirements

N_5 = the average number of helo pilots eligible to fill the specified tour's billet requirements

$N = N_1+N_2+N_3+N_4+N_5$ = the average total number of Aviation Warfare Officers eligible to fill the specified tour's billet requirements

In each case above, the average number refers to the officer inventory averages over the fiscal years modelled. At the present time the averages are computed for FYs 1980-86. The three apportionment ratios computed represent the ratio of the average prop pilot supply to the: average total prop

community supply, i.e., $\frac{N_1}{N_1+N_2}$, the average total pilot community supply, i.e., $\frac{N_1}{N_1+N_5+N_3}$, and the average total aviation officer supply, i.e., $\frac{N_1}{N}$, for the specific tour in question. As shown, these apportionment ratios are multiplied by the applicable nondiscrete billets; the products, therefore, are the number of nondiscrete billets which should be filled by prop pilots in the tour being analyzed. Summation of all discrete and nondiscrete tour billet requirements results in total billets for prop pilots in the specific tour.

A specific application of the apportionment formula shown above was accomplished to compute the total number of C1 tour CVN requirements which should be filled by prop pilots. The following actual values apply in this example:

b(discrete prop pilot) = 4

b(nondiscrete prop) = 0

b(nondiscrete pilot) = 2

b(nondiscrete aviator) = 0

also the average number of officers available for tour C1 are:

$N_1 = 143$, $N_2 = 197$, $N_3 = 142$, $N_4 = 248$, $N_5 = 219$, $N = 949$

Substitution of these actual values into the apportionment algorithm cited earlier results in the following:

$$\text{b(apportioned)} = 4 + \frac{143}{340}\ (0) \ + \frac{143}{504}\ (2) \ + \frac{143}{949}\ (0)$$

$$= 4 + .419\ (0)\ + .283\ (2)\ + .150\ (0)$$

$= 4 + .566$

$= 4.566$

If the results of the apportionment is a noninteger value, the program displays the result to the nearest integer. The Apportioned Billet matrix shown in Table 3 is the result of all such billet apportionments and is therefore the total requirements for aviation officers in the prop pilot subcommunity. Appendices D, E, and F contain the discrete, nondiscrete, and apportioned billet requirements matrices for all five Aviation Warfare subcommunities, while Appendix L depicts the individual Apportionment algorithms that are applicable to each subcommunity.

6. Supply

The aviation officer inventory data used by the AIRTOURS program was obtained from the Officer Data Simulation Model (ODSM) currently in use by analysts in the MPT Division (OP-13) of the Office of DCNO [Ref. 14]. The ODSM projected the supply of aviation officers, by subcommunity for seven fiscal years (1980-1986). This information was compiled by rank and years of service for each fiscal year available. Appendix G contains the supply of officers in each aviation subcommunity, tabulated by YCS and grade, for the six available fiscal years.

Table 3

NUMBER OF APPORTIONED PROP PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VP	30	1			2	2			1						
2.	VAW(E2B)	9				2	1			1						
3.	VAW(E2C)	7				1	1			1						
4.	VQ1	16	2			3				1						
5.	VQ2	20	2			2	2			1						
6.	VQ3	17	12			1	2			1						
7.	VQ4	34	10			3	2			1						
8.	VC1(VR DET)	3	3			2										
9.	VC2	1								2						
10.	VC3	6				1	3			2						
11.	VC6	1														
12.	VC8	8				1	3			2						
13.	VR24	25				8	8		2	2						
14.	VRC30	15	4			2	1			1						
15.	VRC40	17	4			1	2			2						
16.	VRC50	17	15			1	1			1						
17.	VXE6	8	9			1	1			1						
18.	VXN8	11	1			1	1			1						
19.	VP(SPEC DET)				7											
20.	TACRON 1				3	1										
21.	TACRON 21/22															
22.	LPD															
23.	LPH															
24.	AVT			2				1				1				
25.	CV 1			4				1	1			1				
26.	CV 2			4				1				1				
27.	CVN			5				1	3							
28.	CRUDESGRU															
29.	CARGRU															
30.	ASWOC				2											
31.	2ND FLEET								1							
32.	6TH FLEET				1								1			
33.	7TH FLEET				1											
34.	PACMISRANFAC				4											
35.	NAS GTMO BAY				6											
36.	NAF SIGONELLA	5			14											
37.	NS KEFLAVIK				4											
38.	NAS CUBI POINT	3			8											
39.	NAS AGANA	3			3											
40.	NAF MISAWA				5											
41.	NS ADAK				2											
42.	OTHERS				8											
43.	TRARON XO/CO									11						
44.	FRS CO										3					
45.	MAJOR CMDS													8		
46.	SEQUENTIAL CMDS														3	

C. FUNCTIONAL DESCRIPTION

1. Model Objectives

The AIRTOURS program derives its mathematical formulation and basic program functions from Milch's SWOTOURS model [Ref. 6]; these functions are listed in Appendix O. The program employs the APL programming language which allows for easy manipulation of vector and matrix data and also provides an interactive flow of information between computer and analyst.

The primary objective of the program is to calculate operational and command tour opportunities for each of the specified subcommunities of Aviation Warfare officers. These opportunities are expressed in the form of a ratio of manpower requirements to available supply.

2. Requirements

To compute the manpower requirements, which is the numerator of the opportunities ratio, the model uses data about the number of specific organizations and aviation command categories that are currently projected for the subcommunity in question, in the fiscal years to be modelled. This information is provided by the organization matrices, as illustrated in Appendix B. The second information required is the actual billets, as provided by the Apportioned Billet Requirement Matrices shown in Appendix F. These apportioned matrices are the summation of the discrete and

applicable nondiscrete billets by tour and represent the total manpower requirements for each individual organization and command category within the subcommunity being modelled. The model then computes (via matrix multiplication) the Requirements Matrix. This matrix has as its row dimension the fiscal years for which data analysis was requested and as its column dimension the tour position indication codes. Therefore, the contents of the Requirements Matrix are the total aviation manpower billet requirements by tour and fiscal year, for the aviation subcommunity requested. The Requirements Matrices for each subcommunity are detailed in Appendix H.

3. Supply

The projected supply of officers, the denominator of the opportunities ratio, is determined by a series of calculations. The total inventory of officers for each sub-community is dimensioned by grade, years of commissioned service, and fiscal year. Computation of the officers *eligible* to fill a specific tour requires a complex process which was necessitated among other things, by billet quality requirements.

Billet eligibility is constrained by grade and years of commissioned service; for instance, it is not conceivable that a Lieutenant junior grade with three YCS be eligible for the H2 Major command tour. Therefore, an officer is considered eligible for a tour only if he has completed the proper

years of service and achieved the paygrade commensurate to the tour in question. The model allows the user to specify and vary these two constraints via the Tour Position Indicator Matrix as illustrated by Table 4 and the Tour Grade Match Matrix shown in Table 5.

Table 4

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	7.50	2.50
3.	C1	SUBS OPER SHIP	7.50	2.00
4.	C2	SUBS OPER STAFF	7.50	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

The Tour Position Indicators constrain the eligible supply by specifying the required years of service necessary for any tour. Table 4 shows, for example, that to be eligible for Tour A, the officer must have completed two years of service as defined under the heading BEGIN. The Tour Position Indicators also determine the lengths of the individual tours, thereby designating a span of years for which officers are considered eligible for specific tours. The

length specified for the 1st Operational tour in the example above is three years. Thus, to be considered eligible to fill billet requirements in the 1st Operational tour, the officer must be in his third, fourth, or fifth year of commissioned service. The information contained in Table 4, therefore, is consistent with the tours shown earlier in Figure 2.

Table 5

THE TOUR-GRADE MATCH MATRIX

NO.	CODE	TOURNAMES	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	A	1ST OPERATIONAL	1	1	1	0	0	0
2.	C	SUBS OPER SQD	0	0	1	1	0	0
3.	C1	SUBS OPER SHIP	0	0	1	1	0	0
4.	C2	SUBS OPER STAFF	0	0	1	1	0	0
5.	E	SQD OPER NON-DH	0	0	0	1	0	0
6.	E1	SQD OPER DH	0	0	0	1	0	0
7.	E2	SHP OPER SR.04	0	0	0	1	0	0
8.	G1	OPER CDR	0	0	0	0	1	0
9.	G2/3	SQD OPER XO/CO	0	0	0	0	1	0
10.	G4/5	S.C.I.G.	0	0	0	0	1	0
11.	G6	SHP OPER DH	0	0	0	0	1	0
12.	H1	OPER CAPT	0	0	0	0	0	1
13.	H2	MAJ SEA CMD	0	0	0	0	0	1
14.	H3	SEQ SEA CMD	0	0	0	0	0	1
15.	H4	POST MAJ CMD	0	0	0	0	0	1

The Tour Grade Match Matrix, on the other hand, allows the user to specify the officer grades that will be used by the model when computing the eligible officer supply for any specific tour. In the example depicted in Table 5, for instance, all Ensigns, Lieutenants junior grade, and Lieutenants are considered eligible to fill Tour A billets.

In addition to the constraints described above, the existence of concurrent and overlapping tours (for example, see Tours E, E1, and E2 in Figure 2) further complicates the computation of eligible officers by requiring a logical apportionment of officers between the overlapping tours in question. The AIRTOURS model accomplishes the apportionment using routines specified in the SWOTOURS model [Ref. 6].

With the total supply of officers properly constrained, the model then formats the Supply Matrix of Eligible Officers. This matrix has, as many rows as the number of fiscal years for which data analysis was requested and, as many columns as the number of positions for the selected aviation sub-community. It represents, therefore, the total supply of the specific subcommunity of Aviation Warfare Officers eligible to fill the operational and command tours in each fiscal year selected. Appendix G illustrates the supply data for each subcommunity for the projected fiscal years.

4. Results

Once the Requirements Matrix and the Supply Matrix of Eligible Officers have been formatted, the opportunity ratios are computed by dividing the former by the latter. The resultant output is the Operational Tours Opportunity Matrix, which is dimensioned in the same manner as the two matrices used to construct it; i.e., the rows stand for the fiscal years for which data analysis was requested while the columns represent the tours for the selected aviation subcommunity.

To facilitate display, a ratio of less than one is multiplied by 100, thereby forming an integer value rather than a ratio. These values indicate the probability of any one of the eligible officers obtaining an operational billet in the specified tour position. A computed ratio greater than one implies that the tour is undermanned. Again, to provide a more meaningful and easily interpretable display, in this case the ratio is inverted, subtracted from one, and enclosed in brackets. This procedure was developed by Teply in Ref. 4. These bracketed figures represent the percentage of billet shortfall for the tour positions indicated.

D. MODEL ASSUMPTIONS AND LIMITATIONS

The utility of the AIRTOURS model lies in the ability to manipulate the data in the computation of the relevant tour opportunities. None of the various input parameters need be considered immutable; they can be altered either permanantly or temporarily, thereby allowing the user free rein in testing various manpower planning hypotheses.

Through model application analysts can more effectively detect trends necessitating immediate changes to current policies, test proposed alternatives, and analyze outcomes in a cost effective manner [Ref. 5].

Application of the model can be used to determine the effects of future procurement of ships, commissioning or

decommissioning of aviation squadrons, or any other billet requirement changes necessitated by restructuring the Navy's operational force. Changes can also be made in the professional development path through alterations in tour position start points and durations. As an example, the effects of lengthening the 1st Operational tour to greater than three years can easily be determined. Due to the unique nature of the discrete and nondiscrete billet matrices, the effects of redefining nonspecific billet requirements among the various subcommunities can be examined.

It must be remembered, however, that the AIRTOURS program is a model; as such it does not perfectly mirror the Aviation Warfare community. The definition of any model requires certain assumptions to be made which govern model application. The following assumptions and limitations are those outlined in Ref. 6 and include those which are, additionally, pertinent to the AIRTOURS model:

1. The model presently analyzes only operational or sea duty tours, consequently the effects of model operation on the Navy's shore establishment is not directly measureable. However, certain influences concerning shore duty opportunities and shortages may be inferred from model results. For example, if the model indicates increasing shortfall trends in a <u>series</u> of operational tours (i.e., A tour, C tours, E tours, etc.) it is highly probable that manpower

shortages are also occuring in the shore assignments which proceed and follow the tours in question.

2. The model assumes that only officers with years of service matching the tour position parameters are available to fill tour requirements. At times this assumption fails to duplicate actual manpower assignment practices. For example, prop aviation detailers are presently filling billet shortages in the 1st Operational tour with Lieutenant Commanders with over 10 YCS. Although the model cannot presently indicate the results of such a policy directly, it can and does indicate that this policy will no longer be possible in future years when the Lieutenant Commander tours also begin to show deficiencies.

3. The model assumes one hundred per cent manning of all types of organizations. Therefore manpower policies, such as those outlined in the Unrestricted Line Officer Manning Plan [Ref. 15] which stipulates less than total manning of certain operational organization types (Naval Air Stations, afloat staffs, etc.) are difficult to simulate.

4. The model does not "age" its own officer inventory data; therefore, projection accuracy is dependant on extramodel sources (i.e., The Officer Management Simulation Model). It must be understood that AIRTOURS is not an accession model. It will not predict the

number of officers that must be input at the bottom of the career structure to fill billet requirements in the future. The model was designed to project tour opportunities and shortfalls utilizing given accession rates. One could, however, alter the inventory data arbitrarily to test for changes in the resulting tour opportunities.

IV. MODEL OPERATION

A. GENERAL

1. Overview

"The challenge of a computer programmed model is in simplicity of design to limit complications of operation to the end-user and still retain the rigor of the mathematical model so that the results will be meaningful and as accurate as auumpptions allow [Ref. 4]."

The AIRTOURS model was designed to facilitate the aviation manpower planning process by providing computerized support to planners, thereby extending the range and capability of their decision processes and helping them improve their effectiveness.

The AIRTOURS model contains several program functions and subfunctions (listed in Appendix P) which allow the manager to examine and alter the aviation data described in the previous sections. These data can be displayed and changed for each of the five aviation subcommunities defined earlier as comprising the Aviation Warfare Officer community. Examples of the various display, change, and result options will be demonstrated in the following sections. The operations described will include examples of only one subcommunity (prop pilots); this was done to avoid redundancy since model functions operate the same way for each subcommunity.

2. Program Initiation

The main program function of the AIRTOURS model is initiated by specifying the number of years that are to be analyzed and the calendar year in which the analysis is to begin. Currently the data stored in the computer covers the fiscal years 1980-86. If the user wanted to observe the operational tour opportunities for six years beginning in 1981, he would enter: 6 AIRTOURS 1981. If requested, a set of program instructions would then be displayed followed by a statement directing the user to specify the aviation sub-community to be examined. The detailed program instructions, as well as the five subcommunity options available for analysis are shown in Table 6. The AIRTOURS model operates in a continuous loop, which permits the user to transfer among the main model functions of displaying the data, changing the data, and displaying the results. More specifically, once the user has selected the subcommunity he intends to examine, he is presented with the following options:

```
0. DONE WITH ALL WORK:     TYPE 0
1. DISPLAY SOME DATA:      TYPE 1
2. CHANGE SOME DATA:       TYPE 2
3. DISPLAY RESULTS:        TYPE 3
```

It is through these main program subfunctions that the versatility and usefullness of the AIRTOURS program in evidenced.

Table 6

AIRTOURS Program Instructions

```
AVIATION WARFARE OFFICER MODEL


DO YOU WISH TO SEE DETAILED INSTRUCTIONS?   ANSWER YES OR N (NO)!
YES

THIS PROGRAM CALCULATES OPERATIONAL AND COMMAND TOUR OPPORTUNITIES OR SHORTFALLS
FOR THE FOLLOWING FIVE(5) SUBCOMMUNITIES OF AVIATION WARFARE OFFICERS:

1.  PROP PILOTS
2.  PROP NFOS
3.  JET PILOTS
4.  JET NFOS
5.  HELO PILOTS

THE PROGRAM OFFERS THE FOLLOWING OPTIONS:

1.  DISPLAY SOME DATA
2.  CHANGE SOME DATA
3.  DISPLAY RESULTS

SIX TYPES OF DATA MAY BE DISPLAYED FOR EACH SUBCOMMUNITY:

1.  NUMBER OF ORGANIZATIONS BY TYPE AND FISCAL YEAR
2.  TOUR STARTS AND LENGTHS IN YCS FOR EACH TOUR
3.  NUMBER OF BILLETS BY ORGANIZATION TYPE AND TOUR
4.  GRADE ASSIGNMENTS FOR EACH TOUR
5.  INVENTORY OF OFFICERS BY YCS AND GRADE FOR A SINGLE FY
6.  TOTAL INVENTORY OF OFFICERS BY YCS AND FISCAL YEAR

YOU MAY EITHER TEMPORARILY OR PERMENANTLY ALTER THE DATA
BY SELECTION OF THE FOLLOWING CHANGES:

1.  CHANGE NUMBERS OF ORGANIZATIONS BY TYPE
2.  CHANGE THE BEGINNING YEAR AND/OR LENGTH OF ANY TOUR
3.  CHANGE NUMBER OF BILLETS BY ORGANIZATION TYPE
4.  CHANGE THE GRADE ASSIGNMENT FOR SOME TOURS
5.  CHANGE THE INVENTORY OF OFFICERS FOR SOME FISCAL YEAR
6.  CHANGE NUMBERS OF ORGANIZATIONS BY FISCAL YEAR

FOUR TYPES OF RESULTS ARE AVAILABLE FOR DISPLAY:

1.  BILLET REQUIREMENTS FOR EACH TOUR AND FISCAL YEAR
2.  SUPPLY OF ELIGIBLE OFFICERS FOR EACH TOUR AND FY
3.  SEATOUR OPPORTUNITY (SHORTFALL) FOR EACH TOUR AND FY
4.  BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS)

NORMALLY THE VALUES OF THE OPERATIONAL (SEATOUR) OPPORTUNITY TABLE WILL SHOW
THE CHANCE OF BEING ASSIGNED TO AN OPERATIONAL OR COMMAND TOUR FOR OFFICERS
WITHIN THE SELECTED SUBCOMMUNITY WITH COINCIDENT TIME IN SERVICE AND GRADE.
IF THE VALUE IN THE TABLE IS IN PARENTHESES THE TOUR IS UNDERMANNED
AND THE VALUE IS THE PERCENTAGE BY WHICH THE TOUR IS SHORT.

YOU MAY SELECT ONE OF THE FOLLOWING SUBCOMMUNITIES:

DONE          TYPE 0
PROP PILOTS   TYPE 1
PROP NFOS     TYPE 2
JET  PILOTS   TYPE 3
JET  NFOS     TYPE 4
HELO PILOTS   TYPE 5
```

In the following sections each of these main subfunctions will be explained and demonstrated.

B. PROGRAM SUBFUNCTION

1. Display

The "DISPLAY SOME DATA" option is designed to retrieve data used in the calculation of the tour opportunities. As shown below, six types of data may be displayed:

```
0. DONE WITH DISPLAYING DATA:                                   TYPE 0
1. NUMBER OF ORGANIZATIONS BY TYPE AND FISCAL YEAR:             TYPE 1
2. TOUR STARTS AND LENGTHS IN YCS FOR EACH TOUR:                TYPE 2
3. NUMBER OF BILLETS BY ORGANIZATION TYPE AND TOUR:             TYPE 3
4. GRADE ASSIGNMENTS FOR EACH TOUR:                             TYPE 4
5. INVENTORY OF OFFICERS BY YCS AND GRADE FOR A SINGLE FY:      TYPE 5
6. TOTAL INVENTORY OF OFFICERS BY YCS AND FISCAL YEAR:          TYPE 6
```

The first display available enables the analyst to examine the number of organizations and command categories forecast for each fiscal year. As an example, the various aviation units which represent operational and command assignments for prop pilots are shown in Table 7. The organization forecasts for all five subcommunities are contained in Appendix B.

The second display option enables examination of the tour starts and lengths of each tour in years of commissioned service. As explained in Section III.C.3., the start of the tour is the number of years of service the officer must have before he can fill the specified tour position while the length indicates the amount of time an officer will serve in the tour. The Tour Position Indication

Table 7

Prop Subcommunity Organizations and Command Categories

NUMBER OF ORGANIZATIONS FORECAST

NO.	ORGANIZATION	1981	1982	1983	1984	1985	1986
1.	VP	24	24	24	24	24	24
2.	VAW(E2B)	4	4	4	4	4	4
3.	VAW(E2C)	8	8	8	8	8	8
4.	VQ1	1	1	1	1	1	1
5.	VQ2	1	1	1	1	1	1
6.	VQ3	1	1	1	1	1	1
7.	VQ4	1	1	1	1	1	1
8.	VC1(VR DET)	1	1	1	1	1	1
9.	VC2	1	1	1	1	1	1
10.	VC3	1	1	1	1	1	1
11.	VC6	1	1	1	1	1	1
12.	VC8	1	1	1	1	1	1
13.	VR24	1	1	1	1	1	1
14.	VRC30	1	1	1	1	1	1
15.	VRC40	1	1	1	1	1	1
16.	VRC50	1	1	1	1	1	1
17.	VXE6	1	1	1	1	1	1
18.	VXN8	1	1	1	1	1	1
19.	VP(SPEC DET)	1	1	1	1	1	1
20.	TACRON 1	1	1	1	1	1	1
21.	TACRON 21/22	1	1	1	1	1	1
22.	LPD	14	14	14	14	14	14
23.	LPH	7	7	7	7	7	7
24.	AVT	1	1	1	1	1	1
25.	CV 1	2	2	2	2	2	2
26.	CV 2	9	9	9	9	9	9
27.	CVN	2	3	3	3	3	3
28.	CRUDESGRU	8	8	8	8	8	8
29.	CARGRU	6	6	6	6	6	6
30.	ASWOC	8	8	8	8	8	8
31.	2ND FLEET	1	1	1	1	1	1
32.	6TH FLEET	1	1	1	1	1	1
33.	7TH FLEET	1	1	1	1	1	1
34.	PACMISRANFAC	1	1	1	1	1	1
35.	NAS GTMO BAY	1	1	1	1	1	1
36.	NAF SIGONELLA	1	1	1	1	1	1
37.	NS KEFLAVIK	1	1	1	1	1	1
38.	NAS CUBI POINT	1	1	1	1	1	1
39.	NAS AGANA	1	1	1	1	1	1
40.	NAF MISAWA	1	1	1	1	1	1
41.	NS ADAK	1	1	1	1	1	1
42.	OTHERS	1	1	1	1	1	1
43.	TRARON XO/CO	1	1	1	1	1	1
44.	FRS CO	1	1	1	1	1	1
45.	MAJOR CMDS	1	1	1	1	1	1
46.	SEQUENTIAL CMDS	1	1	1	1	1	1

Matrix shown earlier in Table 8 is an example of this display option; the remaining tour position indicators for the various subcommunities are contained in Appendix C.

The number of billets by organization type and tour is the next option available. If the user selects this function, he is directed by the model to choose the specific billet matrix to be observed. The billet matrices available include the discrete and nondiscrete billet matrices which are applicable to the particular subcommunity being analyzed. For example, in the prop pilot subcommunity, the billet matrices available for display include the discrete prop pilot billets, the nondiscrete billets which must be apportioned among all prop aviators (i.e., pilot and NFO's), the nondiscrete billets which must be divided among all pilots (i.e., prop, jet, and helo), and the nondiscrete billets which must be apportioned among all aviators; also available for display is the apportioned matrix, which contains the total billet requirements for prop pilots. Examples of the various prop pilot billet matrices were given in Section III.B.5.; the discrete, nondiscrete, and apportioned billet matrices for all aviation subcommunities are contained in Appendices D, E, and F respectively.

The fourth display option available is the grade assignments for each tour. Selection of this option displays the Tour Grade Match Matrix, which defines the paygrades the model uses for each tour position when computing the eligible

officer supply. An example of the Tour Grade Match Matrix was illustarted earlier in Table 5.

The final two options display officer inventory data in one of two forms. The inventory data may be displayed by YCS and grade for a single fiscal year. Table 8 shows, for example, the prop pilot inventory forecast for 1981. The second means of displaying inventory data is illustrated by Table 9. This is the total inventory of prop pilots by YCS for the fiscal years selected during model initiation. Appendix G contains the officer inventory information for each fiscal year and aviation subcommunity.

2. Changes

The second major program function available enables AIRTOURS model users to change any of the matrices discussed under the display options. These change options are as follows:

```
0. DONE WITH ALL CHANGES:                                       TYPE 0
1. CHANGE NUMBERS OF ORGANIZATIONS BY TYPE:                     TYPE 1
2. CHANGE THE BEGINNING YEAR AND/OR LENGTH OF ANY TOUR:         TYPE 2
3. CHANGE NUMBER OF BILLETS BY ORGANIZATION TYPE:               TYPE 3
4. CHANGE THE GRADE ASSIGNMENT FOR SOME TOURS:                  TYPE 4
5. CHANGE THE INVENTORY OF OFFICERS FOR SOME FISCAL YEAR:       TYPE 5
6. CHANGE NUMBERS OF ORGANIZATIONS BY FISCAL YEAR:              TYPE 6
_
```

As shown, each option generally deals with changes to the data matrices explained in the preceding section.

The simpest of the changes is an alteration of the number of organizations projected. For example, suppose the number of Maritime Patrol Squadrons (VP) were increased

Table 8

INVENTORY OF PROP PILOT OFFICERS FOR 1981

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	6					
2.	167					
3.		286				
4.		167				
5.			277			
6.			199			
7.			187			
8.			120			
9.			60	10		
10.			6	68		
11.				50		
12.			2	55		
13.				109		
14.				125		
15.				82	31	
16.					65	
17.					62	
18.					53	
19.					40	
20.					46	
21.					27	
22.					21	21
23.						27
24.						50
25.						51
26.						54
27.						41
28.						38
29.						19
30.						16
31.						12

Table 9

TOTAL INVENTORY OF PROP∆PILOT OFFICERS

YCS	1981	1982	1983	1984	1985	1986
1.	6	• 7	7	7	7	7
2.	167	167	187	187	187	187
3.	286	300	316	330	330	330
4.	167	309	326	342	355	355
5.	277	163	300	317	332	345
6.	199	233	137	252	266	279
7.	187	126	147	87	160	168
8.	120	115	77	90	53	98
9.	70	93	88	57	69	40
10.	74	59	80	80	51	61
11.	50	54	40	53	53	36
12.	57	42	46	34	45	45
13.	109	50	38	42	31	41
14.	125	102	47	36	40	29
15.	113	118	93	43	33	36
16.	65	84	87	58	23	19
17.	62	63	81	85	67	30
18.	53	59	59	77	80	63
19.	40	51	57	57	74	78
20.	46	36	46	51	51	66
21.	27	39	30	36	44	44
22.	42	13	35	26	35	39
23.	27	25	13	21	15	20
24.	50	25	23	12	19	14
25.	51	45	23	21	11	18
26.	54	43	39	20	18	10
27.	41	50	40	36	18	17
28.	38	34	41	33	29	15
29.	19	28	25	30	24	22
30.	16	14	21	19	22	18
31.	12	16	14	21	19	22

from 24 to 30, at the rate of one squadron per year starting in 1981. To determine the effects on available prop pilot manpower, the only change needed would be to increase the number of VP squadrons in the organization. Table 10 is an example of the interactive procedures required to make this change. As shown in Table 10, the alteration in the number of organizations is accomplished by first selecting change option 1, then typing the number of the organization to be changed. Reference to the Organization Matrix in Table 7 shows that the number for VP squadrons in 1. The model then displays the present numbers of VP squadrons for projected fiscal years selected earlier and asks the user if he wishes to change the projected data. If the user replies -YES, the model informs him how to alter the data, i.e., by typing in the new values separated by blank spaces. Once the required change has been made, the model enables the user to make alterations in additional organization quantities by specifying the proper organization number. If, as in the example depicted, no additional organizations need altering, the user simply input a zero (0) and the model then permits the user to specify whether the data should be changed permanently or only temporarily. If temporary alteration is specified, the original values (i.e., 24 VP Squadrons for each fiscal year) will replace the temporary numbers upon exiting from the model.

Table 10

Sample Change Procedure

```
THE FOLLOWING CHANGES MAY BE MADE IN THE DATA:

0. DONE WITH ALL CHANGES:                                  TYPE 0
1. CHANGE NUMBERS OF ORGANIZATIONS BY TYPE:                TYPE 1
2. CHANGE THE BEGINNING YEAR AND/OR LENGTH OF ANY TOUR:    TYPE 2
3. CHANGE NUMBER OF BILLETS BY ORGANIZATION TYPE:          TYPE 3
4. CHANGE THE GRADE ASSIGNMENT FOR SOME TOURS:             TYPE 4
5. CHANGE THE INVENTORY OF OFFICERS FOR SOME FISCAL YEAR:  TYPE 5
6. CHANGE NUMBERS OF ORGANIZATIONS BY FISCAL YEAR:         TYPE 6

⎕:
      1

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      1
                         CURRENT NUMBERS

NO.  ORGANIZATION          1981  1982  1983  1984  1985  1986

 1.  VP                     24    24    24    24    24    24

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
⎕:
      25 26 27 28 29 30

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      0

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

DO YOU WANT TO SELECT ANOTHER SUBCOMMUNITY?   ANSWER YES OR N (NO)!
NO
```

When all desired changes to the organization list have been accomplished, the user is presented with a chart, reminder of the available change options, thereby enabling him to select another group of data for alterations. The five remaining options include changes to the Tour Position Indicator Matrix, the discrete and nondiscrete billet matrices, the Tour Grade Match Matrix, and the various inventory matrices. Examples of all types of changes will be discussed in Section V, Model Application and Analysis.

3. Results

Selection of the final major subfunction "DISPLAY RESULTS" causes the following options to be presented to the model user:

```
THE FOLLOWING RESULTS MAY BE DISPLAYED BY TYPING THE APPROPRIATE NUMBER:
0. DONE WITH DISPLAYING RESULTS                                  TYPE 0
1. BILLET REQUIREMENTS FOR EACH TOUR AND FISCAL YEAR             TYPE 1
2. SUPPLY OF ELIGIBLE OFFICERS FOR EACH TOUR AND FY              TYPE 2
3. SEATOUR OPPRTUNITY (SHORTFALL) FOR EACH TOUR AND FY           TYPE 3
4. BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS)           TYPE 4
```

The first results matrix indicates the total billet requirements, for the subcommunity selected, by tour and fiscal year. Table 11 depicts the total manpower requirements for the prop pilot subcommunity. Also included in the display is the average number of billets for each five year period analyzed by the model. For instance, in the example shown, the model analyzed fiscal years 1981-86; therefore, for the five year intervals 1981-85 and 1982-86 average results are also shown. This averaging is a feature of all four results displays.

Each aviation subcommunity has specific requirements for the aviation officers within them. The requirements matrices for all aviation subcommunities are contained in Appendix H .

Table 11

NUMBER OF PROPΔPILOT SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	1022	86	59	84	92	86	16	12	66	3	7	1	8	3	2
1982	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1983	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1984	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1985	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1986	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1981-85	1022	86	62	84	92	86	17	14	66	3	7	1	8	3	2
1982-86	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2

The supply of eligible officers for each tour and fiscal year is obtained by selecting the second results option. Table 12 illustrates an example of this matrix for the prop pilot subcommunity. The results shown indicate the number of prop pilots eligible to fill each operational tour. For example, the model projects that in 1985 there will be 1017 prop pilots of the proper YCS and grade eligible to fill billets in the 1st Operational tour (tour A). The remaining supply matrices for the other subcommunities are depicted in Appendix I.

Table 12

NUMBER OF PROPΔPILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	730	446	59	85	141	140	28	21	110	16	46	6	71	60	45
1982	772	417	65	87	92	109	31	26	117	13	45	4	46	50	38
1983	942	323	72	96	77	76	24	30	133	17	49	3	33	35	27
1984	989	384	59	78	64	53	12	35	150	19	53	3	30	23	18
1985	1017	453	51	69	70	45	11	32	146	19	57	3	31	17	12
1986	1030	496	43	58	73	47	10	20	105	24	65	3	31	16	12
1981-85	890	404	61	83	89	85	21	29	131	17	50	4	42	37	28
1982-86	950	414	58	78	75	66	18	29	130	18	54	3	34	28	21

The tour opportunities matrix is the third result option available for display. As stated in Section III.C.4., these values indicate the probability of one of the eligible officers obtaining an operational or command billet in the specified tour position, with the bracketed values indicating shortfalls within the tours so indicated. Table 13, which depicts the tour opportunities for prop pilots, shows shortfalls in tour A for every year depicted.

Table 13

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROPΔPILOT OFFICERS IN PERCENTAGE

YEAR	*A*	*C*	*C1*	*C2*	*E*	*E1*	*E2*	*G1*	*G2/3*	*G4/5*	*G6*	*H1*	*H2*	*H3*	*H4*
1981	(29)	19	99	99	66	61	57	56	60	17	16	11	11	5	5
1982	(24)	21	97	97	(1)	79	55	55	57	20	16	17	17	6	6
1983	(8)	27	88	88	(17)	(12)	73	48	49	16	15	23	23	9	9
1984	(3)	22	(7)	(7)	(31)	(38)	(27)	42	44	15	14	25	25	14	14
1985	(1)	19	(19)	(19)	(24)	(47)	(37)	46	45	14	13	24	24	19	19
1986	99	17	(32)	(32)	(21)	(46)	(40)	72	63	11	11	24	24	20	20
1981-85	(13)	21	(2)	(2)	(4)	(2)	80	49	50	16	15	18	18	9	9
1982-86	(7)	21	(8)	(8)	(19)	(23)	97	51	51	15	14	22	22	11	11

The shortfalls shown may or may not exist in reality. In other words, the existence of a shortfall in an operational tour simply means that based on the given tours, manpower requirements, and the supply of officers considered eligible to fill the tour, there are more billets than eligible officers In fact, for 1981 the model projects that 29% of tour A billets will be unfilled. However, the model does not account for various detailing practices which may actually take place to fill the billet requirements in the operational tours indicating shortfalls. Therefore, even though shortfalls may appear in the model, they may not be as severe in the

actual organizations modelled, and may even be totally eliminated by appropriate detailing procedures. An example of a detailing practice which would tend to reduce actual operational tour shortfalls is the policy of granting tour extensions, which permits officers to remain in tours longer than the model parameters specify. This type of policy would effectively increase the supply of officers available to fill billets in specific tour positions and thus lower actual shortfalls experienced in the fleet. The extent of shortfall reduction would depend on the number of officers allowed to extend and the length of the extensions. The effects of this and other manpower planning alternatives will be discussed in Section V. Appendix J contains the tour opportunities for all subcommunities.

The final results option allows the user to display billet rates, which are defined as the requirements divided by tour length. The billet rate then is the average yearly flow of officers through the tours indicated. For example, Table 14, which illustrates the billet rates for prop pilots, shows that the average annual turnover of prop pilots in the 1st Operational Tour (Tour A) is 341.

Table 14

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR PROP PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	341	34	29	42	37	34	8	6	26	2	4		4	2	1
1982	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1983	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1984	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1985	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1986	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1981-85	341	34	31	42	37	34	8	7	26	2	4		4	2	1
1982-86	341	34	32	42	37	34	9	7	26	2	4		4	2	1

If the assumptions made in the model apply (i.e., all tour A billets will be filled by officers in their 3rd, 4th, or 5th year of commissioned service), then the billet rate indicated for tour A represents the total number of prop pilots that must be trained each year to maintain the present billet requirements, since lateral entry into tour A is possible only for a limited number of prop aviators, namely, officers who have changed their designator and become prop pilots. Appendix K contains the billet rates for the remaining aviation subcommunities.

V. MODEL APPLICATION AND ANALYSIS

A. INTRODUCTION

Aviation manpower planners are currently faced with aviation officer inventory levels which are insufficient to meet all the Navy's needs. To cope with this critical situation, managers must use all the tools available to plan for the optimal utilization of aviation personnel. The AIRTOURS model can be used to assess the utility of various manpower planning alternatives by providing analysts with the capability of testing alternative policies in a simulated environment. Simulation of events has several advantages, including savings in time and resources, as well as the ability to examine hypothetical situations without actually altering real world parameters.

The following analysis was designed to illustrate AIRTOURS model capability through simulation of various scenarios which represent possible manpower planning alternatives in the Aviation Warfare community. This analysis consists of a thorough examination of the results matrices for the five aviation subcommunities to determine the operational tours which are either currently, or are projected to be, manpower planning problems in future years. The analysis then, demonstrates the capability of the AIRTOURS model by implementing several different changes to subcommunity parameters.

B. ANALYSIS OF CURRENT SUBCOMMUNITY DATA

Appendices H through K contain the results matrices for all five aviation subcommunities projected for the next six fiscal years with Appendix J illustrating the operational tour opportunities and shortfalls specifically. These results, as expected, show that the aviation community, as a whole, contains substantial manpower deficiencies within several critical tours in all five subcommunities.

For example, all subcommunities contain 1st Operational tour shortfalls of varying degrees of severity. In every instance, however, these shortfalls are projected to decrease over the period analyzed by the model. The decreasing tour A shortfalls appear to be the result of increased Pilot and Naval Flight Officer Training Rates (PTR and NFOTR, respectively) projected by the POM-82 Five Year Defense Plan (FYDP) [Ref. 16]. Table 15 illustrates the planned PTR's and NFOTR's for the next six years. If the projected rates are attained, the 1st Operational tour opportunities and shortfalls indicated by the AIRTOURS model are valid. If the projected training rates are not achieved, as has sometimes been the case in the past [Ref. 17], then the AIRTOURS model has probably underestimated the shortfalls or the opportunities in tour A.

Although the Subsequent Operational Squadron tour results indicate no billet fill difficulties for the pilot subcommunities,

Table 15

Planned PTR's Through POM-82 FYDP

FY	PROP	JET	HELO
81	322	324	251
82	333	313	304
83	359	315	321
84	359	315	366
85	359	320	366
86	359	330	366

Planned NFOTRS Through POM-82 FYDP

FY	PROP	JET
81	254	216
82	268	224
83	257	232
84	257	224
85	257	224
86	257	222

these data must be evaluated with caution. As presently constrained for all pilot subcommunities, the C tour occurs immediately following the A tour. It was constructed in this manner to account for the various squadron billet structures that require experienced aviators in the grade of Lieutenant, and to model actual manpower policy which allows certain pilots to be detailed to subsequent operational flying duty outside their primary warfare specialties. The positioning of this tour also represents the time frame when officers who were assigned as flight instructors immediately upon completion of training (SERGRADS) enter the operational fleet, and they are, in fact, a major source of manpower for this tour.

The C tour billets are positioned, therefore, at a time point which is coincidental to traditional shore duty assignments. Current aviation officer detailing policy requires that many of these shore requirements must receive priority manning. CNO policy states, for example, that all recruiting command billets will be 100% manned [Ref. 15]. This policy is not necessarily confining in and of itself; however, Monthly Officer Status Report data [Ref. 18] published in April 1980, indicates a shortfall of over 800 Lieutenant Aviation Warfare Officers. Consequently, it may be assumed that shortfalls probably exist for pilots with years of service which would make them eligible to fill tour C requirements. The AIRTOURS model is presently

constrained to operational or sea duty analysis; therefore, it is unable to project total tour opportunities (i.e., shore and sea duty) at any point in time. What the model is able to project, in the case of C tour pilot requirements, is trends. For example, in the case of the prop pilot subcommunity, if shortfalls are assumed to be present even with an apparant tour C opportunity ratio of 19% (FY 81), then any increase in future FY's signals a greater overall manpower shortfall at this career point. Tour opportunity decreases in future years similarly would indicate a reduced manpower deficit, relative to the initial benchmark.

Tour C for NFO's does not occur at the same time as it does for pilots, since there is very little fleet demand for experienced NFO's immediately following the 1st Operational tour. For the NFO subcommunities modelled, current data reflects that the Subsequent Operational Squadron tour (Tour C) occurs coincidentally with the C1 and C2 tours, which are both considered as sea duty assignments. Therefore, tour C opportunities for the two Naval Flight Officer subcommunities may be interpreted directly as are the remaining operational tours.

1. Prop Pilots

Based on a projected PTR of 359 prop pilots after 1982, results of current data reveal that first tour shortfalls will be eliminated by 1986. Billet rate data in Appendix K also indicates that, given no other changes in

first tour requirements, a balanced A tour (i.e., approximately 100% tour opportunity) can be maintained by a PTR of 341 prop pilots per year. Tour C opportunities average 21% for the five year period 1981-85; however, the overall trend after 1984 is decreasing, indicating a possible improvement in the manpower supply at this career point.

Results indicate that after 1982, the Subsequent Operational Squadron (C1) and Staff (C2) tours, as well as the Lieutenant Commander Squadron tours (E and E1), will be increasingly difficult to fill. The squadron department head tour appears to be the most seriously affected, with almost 50% shortfalls in FY 85 and FY 86. Aviation Squadron Command opportunities appear adequate until 1983, when the ratio drops below 50%. This decline is due to the greater numbers of officers becoming eligible for squadron command by virtue of having attained the required YCS. Overall average squadron command opportunity for the five year period 1981-85 remains at approximately 50%. The trend in opportunities for both major and sequential commands is increasing over the time frame analyzed.

2. Jet Pilots

Results depicted for jet pilots are very similar to those outlined for the prop pilot community, although for many tours, the shortfalls are more severe. The exception to this is the first operational tour where shortfalls of

jet pilots are 18% in 1981 decreasing to 3% in 1986. Unlike the prop pilot community, the first tour shortages are not entirely eliminated by the PTR's projected, which indicates that PTR's even higher than those forecast may be necessary to meet tour A billet requirements for jet pilots.

Tour C opportunities for jet pilots are approximately twice as high as the same opportunities in the prop subcommunity. The opportunities trend is fluctuating over the six year period analyzed with a five year average of 38% for 1981-85. This relatively high tour opportunity could signal serious problems within the shore establishment, based on analysis cited earlier.

The Subsequent Operational Ship (C1) and Staff (C2) tours also exhibit shortfalls more critical than those projected for the prop community, averaging 18% for FY 82-86. Perhaps the most critical problems projected for the jet pilot community occurs in Lieutenant Commander and Commander tours. In the E and E1 tours shortfalls are projected to increase every year after 1981, culminating in 1986 with a 72% deficiency in officers eligible to fill Squadron Department Head billets. Appendix I indicates that, ceteris paribus, there will be only 46 officers available to fill 167 tour E1 requirements.

The G2/3 Aviation Squadron Command tour also indicates some remarkable results. Opportunity to command an aviation squadron has traditionally been higher for jet pilots than for

other aviation communities due to the large number of single pilot aircraft in the Navy's jet aircraft inventory. However, the results depicted in Appendix J indicates a five year average opportunity of 76% with <u>shortfalls</u> projected for 1986! It is highly unlikely that the critical XO/CO tour will be gapped; however, the existence of this abnormally high opportunity for command (Navy wide average aviation command opportunity is 55%) indicates an inherent lack of selectivity available to aviation command screen boards. Analysis presented later will indicate several alternatives available to regain this selectivity and thereby ensure a supply of only the "best fitted" officers for aviation command. Relatively high major and sequential command opportunities also exist for jet pilots. This is to be expected, however, since command of aircraft carriers is presently limited to jet aviation officers. Should this policy change in the future, a more balanced major and sequential command opportunity would be realized.

3. <u>Helo Pilots</u>

Of the five aviation subcommunities examined, the helicopter community exhibits the fewest manpower shortages. With the exception of first tour shortages in 1981 and some relatively minor C1 and C2 tour shortfalls in FY 84 and FY 85, the helo subcommunity appears healthy. The PTR for helo pilots is projected to increase significantly between 1981 and 1984. The commissioning of HCV 4 and HCV 5 in 1983 and

1984 respectively, as well as the introduction of the LAMPS MK III squadrons to the fleet commencing in late 1984, necessitate this increased training rate. If the projected rates are achieved, the helo subcommunity should be able to fulfill all billet requirements projected.

4. Prop Naval Flight Officers

Results of current data for prop NFO's also show major shortages in the first tour position with these shortfalls being reduced gradually through 1986, although the shortfalls are not projected to have been eliminated entirely as was the case for prop pilots. This projected reduction in shortfalls is again attributable to the increased NFOTR. Fulfillment of Subsequent Operational tours (C, C1, C2) will pose no problem until 1984, when these tours will also begin to experience shortfalls. Aviation squadron command opportunities for prop NFO's is slightly lower than for pilots in the same subcommunity. This is attributed to the fact that NFO's are not presently eligible for command of training squadrons whose mission is pilot training exclusively; therefore, there are fewer squadrons that NFO's are eligible to command.

5. Jet Naval Flight Officers

Other than first tour shortfalls, the jet NFO subcommunity will be able to fill all of the projected billet requirements through 1986 with no apparent problems. As will be demonstrated later, the existence of fairly "healthy" NFO

subcommunities provides planners with alternative manpower supplies to help cure the problems created by decreasing pilot inventories.

C. AVIATION PARAMETER ALTERATIONS

There are several areas in which manpower managers may readily vary pertinent data to affect the outcome of tour opportunities:

Alterations in billet structure for specific duty assignments and tour positions.

Alterations in tour position through changes in starting points and durations.

Alteration of billet grade requirements.

Alteration of the supply of aviation officers eligible to fill billet requirements.

The following analysis will attempt to demonstrate the utility and flexibility of the AIRTOURS model by implementing some of these types of alterations. The changes presented should not be considered reflective of offical manpower planning policies. The options investigated merely represent conceivable alternatives designed to demonstrate the manipulative capability of the AIRTOURS model. The discussion in the following sections will be more meaningful if referral is made to Appendices M through O, where the results of the computer sessions in which the specific changes were made are presented.

The tour opportunity matrices illustrated in Appendix J should be used as benchmarks with which to compare the tour opportunities that resulted when the current data were changed.

1. Billet Requirement Alterations

Manpower requirements for sea duty assignments will vary, depending on the rate of hardware aquisitions and disposals. Alterations in numbers of ships and squadrons will dictate changes in billet requirements which, in turn, require modifications in manpower policies to ensure efficient fulfillment or elimination of such requirements [Ref. 5]. When using the AIRTOURS model to analyze billet requirement alternatives, the model user must be cautious to ensure that the changes chosen provide manpower with the required rank, experience, and training to fill newly established billets. Similarly, when billets are eliminated, care should be taken to ensure that a proper balance or mix of billet quality is maintained.

The Unrestricted Line Officer Manning Plan (OMP) [Ref. 18] provides justification for several of the manpower requirement alterations to be implimented here. Present guidance indicates that reductions in aviation squadron manning below levels indicated by the Officer Master Billet File are authorized and, in fact, are being implemented as policy. Similarly, the OMP recognizes the necessity to mismatch officers with billet grade and designator requirements when attempting to cope with an untenable manpower shortage.

a. Organization Requirements

Prior to instituting any changes in the aviation data, the ramifications of an increase in operational units is evident through examination of the data currently available. The various organization matrices (Appendix B) reveal that one CVN class aircraft carrier will be added to the fleet in 1982. The additional billet requirements cause various changes to all aviation subcommunities in the relevant tour positions affected. For example, these added requirements contributed to the increased manpower shortfalls projected for jet pilots in the C1 tour between 1981 and 1982. The jet pilot shortfalls in this tour cannot be completely attributed to the additional aircraft carrier, however. While the CVN will create seven new jet pilot billets in 1982, the supply of officers eligible to fill these billets is projected to decrease by 14 officers, thereby indicating that the new CVN will simply intensify an already deteriorating situation.

Current data for the helo pilot subcommunity also depicts the results of additional aviation organizations. HCV 4 and HCV 5 are scheduled to be commissioned in FY 83 and FY 84 respectively, while the LAMPS MK III squadrons will begin joining the fleet in 1984 with the commissioning of one additional squadron per year in 1985 and 1986. Referral to Appendix J shows that the inclusion of these new units will present no manpower problems to the helo pilot subcommunity due to concurrent projected increases in the helo pilot inventory.

As shown in Appendix M, Change I demonstrates the opposite alteration of manpower requirements. This change reflects the effect on the jet pilot community of the decommissioning of Fleet Support Squadrons VC-2 and VC-7, also, to remain in consonance with the OMBF, VC-6 billets were redesignated as shore duty eliminating yet another operational organization. The major effect of these changes occured in the first operational tour, where the AIRTOURS model projected that as a result all shortfalls will be eliminated by 1986. Slight shortfall reductions are also evidenced in the E and E1 tours due to reduced requirements for Lieutenant Commander, as well as small reductions in squadron command opportunities. In the case of jet pilots, these reduced command opportunities should probably be viewed as a benefit, since they allow a slightly greater degree of selectivity in the command screening process.

b. Billet Structure Changes

Change II in Appendix M depicts the option of altering billet requirements by specific tour position, again using the jet pilot subcommunity as an example. Discrete jet pilot billet requirements in the Subsequent Operational - Ship tour (C1) were reduced by three jet aviators on all applicable aircraft carriers. The resulting opportunities matrix shows that virtually all jet pilot shortfalls were eliminated in this tour.

The three billets per CV eliminated for jet pilots, would undoubtedly have to be filled by another subcommunity. Change III illustrates the resultant tour opportunities if all three billets were designated as jet NFO requirements. As shown, no problems would occur until 1986 when slight tour C1 shortfalls were projected. This billet requirements change was a logical one since some jet pilot billets aboard carriers could be adequately filled by NFO's. For example, the Gunnery/Ordanance Officer, Assistant Catapult and Arresting Gear Officer, and the Assistant Carrier Air Traffic Control Officer are all C1 tour billets with designator requirements presently specifying jet pilots. These billets could undoubtedly be filled by jet NFO's.

Change IV depicts an alteration to the jet pilot community similar to that presented in Change II. In this case, all C1 tour discrete jet pilot billets are converted to nondiscrete aviator billets. Redesignation of billet requirements into nondiscrete categories allows manpower planners increased flexibility in the assignment process, thereby enabling a more optimal utilization of available manpower. Change IV results indicate that a billet requirements alteration of this type would eliminate all C1 and C2 tour shortfalls in the jet pilot subcommunity. Of course, such a change will affect the other subcommunities as well and if it were actually contemplated the result of such a change on the other subcommunities would have to be analyzed and weighed in conjunction with the above results.

Change V is an example of a billet structure alteration in the prop pilot subcommunity. The alterations depicted in Appendix H show the reduction of mandated billet requirements by one aircrew per squadron for ASW and TACAIR units (VP and VW), and, where considered feasible, one aircrew per type aircraft flown for Fleet Support Squadrons (VQ, VC, VR, etc.). These reductions were apportioned among the A, E, and E1 tours by reducing the A tour billet requirement by two pilots and the E or E1 tour requirements by one pilot in all squadrons with three pilot flight crews (eg. VP, VQ). In squadrons with only two pilots per crew (eg. VAW), the billet reductions were evenly distributed between A and E tours. Results show that E tour shortfalls were eliminated in all years except 1984, while E1 deficits were also greatly reduced. Additionally, first operational tour shortfalls were reduced such that no shortfalls were projected after 1982.

2. <u>Tour Position Alterations</u>

Adjustments in tour positions must be undertaken with caution to consider properly the various qualitative billet requirements. For example, a model user may wish to modify the E1 Department Head tour such that its tour start point be at 6 YCS and concurrently alter the billet grade requirements to allow Lieutenants to fill E1 billets. However, an alteration of this type would not realistically reflect current policy, nor would it represent a realistic

alternative to current policy, given shore requirements at this same career point. Another such change would be to increase the duration of a tour without regard to the effects on the starts and durations of following tours. Probably the most important consequence of tour length alteration is the impact this type of change has on shore assignments. Any lengthening of the operational tours to gain additional eligible officers for sea duty assignments concurrently reduces the supplies available to fill shore assignments. If there were an overabundance of aviation officers to fill shore requirements this would not be a problem; unfortunately, the opposite is the case. As stated earlier, the Monthly Officer Status Report [Ref. 19] published by NMPC in April 1980, indicated inventory shortfalls of over 800 Lieutenants in authorized shore duty billets. Although several of the following model applications may affect adjacent shore duty assignments, it must be kept in mind that the changes presented are designed to meet fleet requirements only.

The tour position adjustments described below are illustrated in Appendix N. As before, tour opportunity results must be compared with the benchmark matrices in Appendix J.

Change VI shows the effect on the jet NFO subcommunity of legthening the first operational tour by one year. Although implementation of this change would shorten following shore assignments significantly, operational

requirements may necessitate such measures. Tour opportunity results reveal that this option would completely eliminate all Tour A shortfalls for jet NFO's.

Change VII illustrates similar tour change for prop pilots. This alteration, however, lengthens the E and E1 tours to 3 years while simultaneously moving the tour starts to the end of the 10th and 11th years, respectively. This tour movement is in consonance with current officer detailing policy in the prop pilot subcommunity. The resulting opportunities matrix show that although tour E and E1 shortfalls would not be eliminated, they would be reduced significantly.

An example of a tour change and an accompanying billet grade requirement alteration is depicted by Change VIII, again using the prop pilot subcommunity to illustrate the affects of the change. The Operational-Senior 04 tour, (E2) consisting of various carrier and staff billets, is normally reserved for Lieutenant Commanders who have completed an early squadron Lieutenant Commander tour. Implementation of Change VIII would alter tour E2 such that its start point would be moved to the end of the 14th YCS; comensurate with this movement, a billet grade requirement alteration would be implemented allowing officers in the grade of Commander to be considered eligible for this tour. Results show that an alteration of this type would eliminate all E2 tour shortfalls for prop pilots.

The final tour position alteration, Change IX, was designed to show the effect on the jet pilot subcommunity of lengthening the G2/3 Squadron XO/CO tour by six months and moving it one year earlier in the officer career path. A change of this type would be feasible, since an officer is screened for aviation command in his 13th year of commissioned service. Results of this change shown in Appendix N indicate that the command opportunity for jet pilots would be reduced to approximately 50% through FY 84; however, after 1984, opportunities are again very high with 1986 indicating a shortfall of greater intensity than was originally projected. Changes of the type proposed above were not designed to limit the command opportunities for aspiring jet pilots. They were proposed simply to allow the community greater selectivity in choosing officers for these critical billets.

3. Multiple Parameter Alterations

The following application is designed to illustrate model diversity through several combinations of changes for the purpose of fulfilling current requirements and eliminating manpower shortfalls. The prop pilot subcommunity was chosen for this application, although the changes implemented would be equally as applicable to the other subcommunities as demonstrated earlier. The computer session output for this concurrent change implementation is contained in Appendix O.

Change X incorporates the following alterations:

a. VC2, VC7, and VC6 are eliminated from the operational organizations considered, as containing tour opportunities. This reflects the decommissioning and redesignation as shore duty mentioned earlier.

b. The first operational tour (A) is lengthened by six months and the subsequent squadron tour (C) is moved 6 months later in the career path.

c. Similarly, the E and E1 Squadron Lieutenant Commander tours are both increased in duration by 6 months and moved one year earlier.

d. The E2 tour is moved to commence at 14 years of service while tour quality requirements are altered to allow 05 billet fills.

e. Billet structure requirements are changed by eliminating one aircrew per squadron as explained in Change V.

f. All discrete prop pilot C1 tour ship billets are converted to the nondiscrete aviator category.

Results in Appendix O show that employment of these alterations would succeed in meeting practically all prop pilot billet requirements. The only exception would be minor Tour A shortfalls in 1981 and 1982. Again, the effect of these changes on other subcommunities would also have to be examined.

The application of the AIRTOURS program presented in this section has demonstrated the flexibility and utility

of this manpower planning tool. Model capability is in no way limited to the changes depicted for the individual subcommunities and many other feasible changes are possible. Manpower analysts, tasked with the difficult problem of declining aviator inventories, should find the AIRTOURS model a useful addition to their planning arsenal.

VI. CONCLUSIONS AND RECOMMENDATIONS

Management of the distribution of scarce aviation manpower resources will be of critical importance for several years to come if the combat effectiveness of Naval Aviation is to be maintained. The importance and far reaching effects of decisions concerning manpower management requires that planners use every means available in quest of optimal utilization policies. The decision making capability of aviation manpower planners can be greatly enhanced through the use of management science techniques, such as computerized planning models, which provide the capability to simulate and analyze alternative planning options. The models should contain enough detail so that potential users have confidence that the results derived from their use accurately reflects the situations being modelled; concurrently, the models must be easily interpretable so that wide dissemination of model output is enhanced.

Application of the AIRTOURS computer model, developed in this research, has shown how such an interactive management tool can be applied and integrated into the aviation manpower planning process.

The results computed by the model have tended to confirm that Naval Aviation is currently experiencing a serious imbalance between requirements and available inventories in

many of the tours examined and that this imbalance, while more serious in the jet and prop pilot subcommunities, is not confined to them exclusively. The model has also indicated those aviation subcommunities which are <u>not</u> as seriously affected by declining inventories, and whose members may therefore, be able to provide a certain degree of slack in filling important manpower requirements in the future.

More importantly, however, the AIRTOURS model has demonstrated the ability to simulate alternative manpower policies. With this capability at their disposal, manpower managers may be able to revise current resource employment to meet more effectively the organizational goals of the Navy and the individual goals of Aviation Warfare Officers.

The AIRTOURS model is a useful planning tool as it currently exists. There are, however, a number of alterations possible that could be implemented through continued research, which would permit even greater capability. These recommendations are as follows:

1. The integration of shore duty assignments, including appropriate 1000 and 1050 billets, could provide for a more complete analysis of aviation manpower requirements. While inclusion of these complicated requirements may tend to impair the interactive capability of the model, the benefit of a more sensitive model able to analyze total aviation manpower requirements may be worth the sacrifice.

2. The apportionment algorithms as explained in Section III.B.5., presently divide the nondiscrete billet requirements among the various subcommunities based entirely on average supplies. The ability to interactively alter these proportions based on other criteria (eg. requirements) would increase model accuracy and enable enhanced hypothesis testing capability.

3. The model currently analyzes five separate aviation subcommunities and displays results data individually for each. Data analysis capability would be enhanced with the ability to display aggregate data for the following subcategories:

   a. All pilots
   b. All NFO's
   c. All prop community
   d. All jet community
   e. All aviation warfare community

   These categories would be useful for manpower planning decisions at the increased levels of data aggregation.

4. While tour opportunity results at increased levels of data aggregation are useful for certain policy making decisions, a more detailed analysis would also be useful. For example, although the AIRTOURS model projects many shortfalls in the jet community, it does not contain sufficient detail to distinguish among <u>types</u> of jet pilots (i.e., F-14, A-7, S-3, etc.). Therefore, while the subcommunity as a whole may be experiencing manpower shortfalls, supplies of certain types of jet

pilots may be sufficient to fill requirements. A computer model which distinguished Aviation Warfare Officers by the specific type aircraft they fly would enable more effective decision making at this micro level of aggregation and would therefore be a useful endeavor for continued research in this area.

Improvement of the control and management of scarce resources particularily those associated with aviation manpower, will continue to be a challenge in the future. This challenge will require Navy manpower planners to continue to develop extraordinary and innovative planning methods to attempt to cope with and hopefully reverse the serious aviation manpower shortages and thereby prevent the erosion of military combat effectiveness. Computer models carefully tailored to the manpower manager's needs could play an important role in this process.

APPENDIX A

TOUR POSITION INDICATION CODES AND DESCRIPTIONS

1. FIRST OPERATIONAL TOUR (A) - The tour represented by TPIC A was the first operational tour experienced by aviators upon completion of flight training. Assignments in this tour included all junior officer billets (paygrade 03 and below) in Tactical Aircraft (TACAIR), Antisubmarine Warfare (ASW), and Force Support squadrons. Additionally Search and Rescue, overseas Naval Air Station and certain aviation ship billets were also included in this classification.

2. SUBSEQUENT OPERATIONAL TOURS (TPIC's C, C1, C2) - The tours represented by TPIC's C, C1, and C2 included those assignments experienced by aviation officers after their first shore duty. Traditionally these tours have been labelled "disassociated sea duty" since they included assignments outside the aviators normal warfare specialty. The "disassociated" label is misleading; although the incumbents of these billets may not utilize their specific warfare specialties directly, they are not disassociated from the aviation community. All of the billets with these tours specifically require an aviation warfare officer. Consequently, these tours were designated as "subsequent operational" tours, reflecting the requirement that billet incumbents be experienced aviation

warfare specialists. Although these tours occured at approximately the same point in the career development path, the diversity of assignments involved necessitated refinement into the following subsets:

<u>Subsequent Operational - Squadron (C)</u>

This tour contained lieutenant (03) billets in aviation squadrons where the requirements for experienced aviation officers, as addressed by the unit ROC/POE statements, exceeded billet file allowances for experienced aviators in paygrades 04 and 05.

<u>Subsequent Operational - Ship (C1)</u>

Any tour occuring at the specified career point involving assignment to a ship's company billet such as navigator, CIC officer, TSC officer, etc.

<u>Subsequent Operational - Staff (C2)</u>

Any tour that involved assignment to a sea going staff such as a carrier group or cruiser-destroyer group, or to staffs which were classified as sea duty such as overseas naval air stations, certain ASWOC's and numbered fleets.

3. <u>LCDR OPERATIONAL TOURS (TPIC'a, E, E1, E2)</u> - The tours represented by TPIC's E, E1, ane E2 were the operational tours normally encountered by aviation officers while in the grade of Lieutenant-commander.

Squadron Operation - Non-Department Head (E)

Any aviation squadron tour where the billet required an officer in paygrade 04, but was not considered a department head position (i.e., Training Officer, Safety Officer, Natops Officer, etc.).

Squadron Operational - Department Head (E1)

Any aviation squadron tour where the billet incumbent was considered a department head. (Operations, Administrative, Maintenance).

Operational - Senior 04 (E2)

Those tours which required that the billet incumbent had previously served an 04 operational tour. These assignments included billets on carrier airwing (CVW) staffs and aboard carriers.

4. CDR OPERATIONAL TOURS (TPIC's G1, G2/3, G4/5, G6) - TPIC's G1, G2/3, G4/5, and G6 indicated any sea tour requiring the billet incumbent to be in paygrade 0-5 with additional restrictions as follows:

Operational - CDR (G1)

Any operational tour requiring an 05 incumbent and not requiring completion of an XO/CO tour.

Squadron Operational XO/CO (G2/3)

Any tour involving command of an aviation squadron. Since squadron executive officers normally "Fleet Up" to the commanding officer position, this tour represents a composite of the two billets.

Sequential Command In Grade (G4/5)

Any tour considered as a bonus command, including CVW commanders (CAG's), Carrier XO, and Fleet Replacement Squadron (FRS) CO's.

Ship Operational Department Head (G6)

Any ship board department head tour requiring an 05 incumbent who has completed an aviation command tour.

5. OPERATIONAL CAPTAIN TOURS (TPIC's H1, H2, H3, H4) - TPIC's H1, H2, H3, and H4 indicated any sea tour requiring the billet incumbent to be in paygrade 06, with the additional restrictions as follows:

Operational Captain (H1)

Any sea tour requiring an 06 incumbent but not requiring screening by the Aviation major Command Board.

Major Sea Command (H2)

Major sea commands for aviation captains consist of both amphibious and service force ships and Patrol Air Wings (PAW). To be considered eligible for this tour the incumbent must have screened and been selected by the Major Command Screen Board.

Sequential Sea Command (H3)

Sequential Sea Commands include Aircraft Carriers, LHA's, Phibrons, and Servrons. The billet incumbent must have held major sea command to be eligible for this tour.

Post Major Command (H4)

This tour consists entirely of CRUDES GRU Chief of Staff billets. To be eligible for this tour, the billet incumbent must have held major command at sea.

APPENDIX B

AVIATION ORGANIZATIONS AND COMMAND CATEGORIES

PROP COMMUNITY

NUMBER OF ORGANIZATIONS FORECAST

NO.	ORGANIZATION	1981	1982	1983	1984	1985	1986
1.	VP	24	24	24	24	24	24
2.	VAW(E2B)	4	4	4	4	4	4
3.	VAW(E2C)	8	8	8	8	8	8
4.	VQ1	1	1	1	1	1	1
5.	VQ2	1	1	1	1	1	1
6.	VQ3	1	1	1	1	1	1
7.	VQ4	1	1	1	1	1	1
8.	VC1(VR DET)	1	1	1	1	1	1
9.	VC2	1	1	1	1	1	1
10.	VC3	1	1	1	1	1	1
11.	VC6	1	1	1	1	1	1
12.	VC8	1	1	1	1	1	1
13.	VR24	1	1	1	1	1	1
14.	VRC30	1	1	1	1	1	1
15.	VRC40	1	1	1	1	1	1
16.	VRC50	1	1	1	1	1	1
17.	VXE6	1	1	1	1	1	1
18.	VXN8	1	1	1	1	1	1
19.	VP(SPEC DET)	1	1	1	1	1	1
20.	TACRON 1	1	1	1	1	1	1
21.	TACRON 21/22	1	1	1	1	1	1
22.	LPD	14	14	14	14	14	14
23.	LPH	7	7	7	7	7	7
24.	AVT	1	1	1	1	1	1
25.	CV 1	2	2	2	2	2	2
26.	CV 2	9	9	9	9	9	9
27.	CVN	2	3	3	3	3	3
28.	CRUDESGRU	8	8	8	8	8	8
29.	CARGRU	6	6	6	6	6	6
30.	ASWOC	8	8	8	8	8	8
31.	2ND FLEET	1	1	1	1	1	1
32.	6TH FLEET	1	1	1	1	1	1
33.	7TH FLEET	1	1	1	1	1	1
34.	PACMISRANFAC	1	1	1	1	1	1
35.	NAS GTMO BAY	1	1	1	1	1	1
36.	NAF SIGONELLA	1	1	1	1	1	1
37.	NS KEFLAVIK	1	1	1	1	1	1
38.	NAS CUBI POINT	1	1	1	1	1	1
39.	NAS AGANA	1	1	1	1	1	1
40.	NAF MISAWA	1	1	1	1	1	1
41.	NS ADAK	1	1	1	1	1	1
42.	OTHERS	1	1	1	1	1	1
43.	TRARON XO/CO	1	1	1	1	1	1
44.	FRS CO	1	1	1	1	1	1
45.	MAJOR CMDS	1	1	1	1	1	1
46.	SEQUENTIAL CMDS	1	1	1	1	1	1

APPENDIX B (CONT.)

JET COMMUNITY

NUMBER OF ORGANIZATIONS FORECAST

NO.	ORGANIZATION	1981	1982	1983	1984	1985	1986
1.	VF(F4)	8	8	8	8	8	8
2.	VF(F14)	16	16	16	16	16	16
3.	VAL	24	24	24	24	24	24
4.	VAM	12	12	12	12	12	12
5.	VAQ	9	9	9	9	9	9
6.	VS	11	11	11	11	11	11
7.	VQ1	1	1	1	1	1	1
8.	VQ2	1	1	1	1	1	1
9.	VC1	1	1	1	1	1	1
10.	VC2	1	1	1	1	1	1
11.	VC5	1	1	1	1	1	1
12.	VC6	1	1	1	1	1	1
13.	VC7	1	1	1	1	1	1
14.	VC8	1	1	1	1	1	1
15.	VC10	1	1	1	1	1	1
16.	VR24	1	1	1	1	1	1
17.	VRC30	1	1	1	1	1	1
18.	VRC40	1	1	1	1	1	1
19.	VRC50	1	1	1	1	1	1
20.	VAQ33	1	1	1	1	1	1
21.	VFP63	1	1	1	1	1	1
22.	TACRON 1	1	1	1	1	1	1
23.	TACRON 21/22	1	1	1	1	1	1
24.	AVT	1	1	1	1	1	1
25.	CV 1	2	2	2	2	2	2
26.	CV 2	9	9	9	9	9	9
27.	CVN	2	3	3	3	3	3
28.	CRUDESGRU	8	8	8	8	8	8
29.	CARGRU	6	6	6	6	6	6
30.	CVW	12	12	12	12	12	12
31.	2ND FLEET	1	1	1	1	1	1
32.	3RD FLEET	1	1	1	1	1	1
33.	6TH FLEET	1	1	1	1	1	1
34.	7TH FLEET	1	1	1	1	1	1
35.	NAS GTMO BAY	1	1	1	1	1	1
36.	NS KEFLAVIK	1	1	1	1	1	1
37.	NAF MISAWA	1	1	1	1	1	1
38.	NS ADAK	1	1	1	1	1	1
39.	OTHERS	1	1	1	1	1	1
40.	TRARON XO/CO	1	1	1	1	1	1
41.	FRS CO	1	1	1	1	1	1
42.	MAJOR CMDS	1	1	1	1	1	1
43.	SEQUENTIAL CMDS	1	1	1	1	1	1

APPENDIX B (CONT.)

HELO COMMUNITY

NUMBER OF ORGANIZATIONS FORECAST

NO.	ORGANIZATION	1981	1982	1983	1984	1985	1986
1.	HS	11	11	11	11	11	11
2.	HSL	6	6	6	6	6	6
3.	HM	2	2	2	2	2	2
4.	HS1 (SEA)	1	1	1	1	1	1
5.	HC1 (SEA)	1	1	1	1	1	1
6.	HC1 (DET2)	1	1	1	1	1	1
7.	HC1 (DET6)	1	1	1	1	1	1
8.	HC3 (SEA)	1	1	1	1	1	1
9.	HC6 (SEA)	1	1	1	1	1	1
10.	HC11 (SEA)	1	1	1	1	1	1
11.	HC16 (SEA)	1	1	1	1	1	1
12.	HCV4	0	0	1	1	1	1
13.	HCV5	0	0	0	1	1	1
14.	VC6	1	1	1	1	1	1
15.	VC8	1	1	1	1	1	1
16.	VR24	1	1	1	1	1	1
17.	VXE6	1	1	1	1	1	1
18.	TACRON 1	1	1	1	1	1	1
19.	TACRON 21/22	1	1	1	1	1	1
20.	LPD	14	14	14	14	14	14
21.	LPH	7	7	7	7	7	7
22.	LHA	5	5	5	5	5	5
23.	AVT	1	1	1	1	1	1
24.	CV1	2	2	2	2	2	2
25.	CV2	9	9	9	9	9	9
26.	CVN	2	3	3	3	3	3
27.	CRUDESGRU	8	8	8	8	8	8
28.	CARGRU	6	6	6	6	6	6
29.	PHIBRON	4	4	4	4	4	4
30.	2ND FLEET	1	1	1	1	1	1
31.	3RD FLEET	1	1	1	1	1	1
32.	PACMISRANFAC	1	1	1	1	1	1
33.	NAS GTMO BAY	1	1	1	1	1	1
34.	NS KEFLAVIK	1	1	1	1	1	1
35.	NAS CUBI POINT	1	1	1	1	1	1
36.	NAS AGANA	1	1	1	1	1	1
37.	NS ADAK	1	1	1	1	1	1
38.	OTHER SAR	1	1	1	1	1	1
39.	LAMPS MK III	0	0	0	1	2	3
40.	OTHERS	1	1	1	1	1	1
41.	TRARON XO/CO	1	1	1	1	1	1
42.	FRS CO	1	1	1	1	1	1
43.	MAJOR CMDS	1	1	1	1	1	1
44.	SEQUENTIAL CMDS	1	1	1	1	1	1

APPENDIX C

TOUR POSITION INDICATORS

PROP COMMUNITY

PILOTS

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	5.00	2.50
3.	C1	SUBS OPER SHIP	8.00	2.00
4.	C2	SUBS OPER STAFF	8.00	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

NFO's

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	7.50	2.50
3.	C1	SUBS OPER SHIP	7.50	2.00
4.	C2	SUBS OPER STAFF	7.50	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

APPENDIX C (CONT.)

JET COMMUNITY

PILOTS

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.50	3.00
2.	C	SUBS OPER SQD	5.50	2.50
3.	C1	SUBS OPER SHIP	8.00	2.00
4.	C2	SUBS OPER STAFF	8.00	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

NFO's

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	7.50	2.50
3.	C1	SUBS OPER SHIP	7.50	2.00
4.	C2	SUBS OPER STAFF	7.50	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

APPENDIX C (CONT.)

HELO COMMUNITY

PILOTS

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	5.00	2.50
3.	C1	SUBS OPER SHIP	7.50	2.00
4.	C2	SUBS OPER STAFF	7.50	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	23.50	1.50
15.	H4	POST MAJ CMD	24.00	2.00

APPENDIX D

DISCRETE OPERATIONAL BILLETS

PROP PILOT SUBCOMMUNITY

NUMBER OF DISCRETE PROP PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VP	30	1			2	2			1						
2.	VAW(E2B)	9				2	1			1						
3.	VAW(E2C)	7				1	1			1						
4.	VQ1	16	2			3				1						
5.	VQ2	20	2			2	2			1						
6.	VQ3	17	12			1	2			1						
7.	VQ4	34	10			3	2			1						
8.	VC1(VR DET)	3	3			2										
9.	VC2	1								2						
10.	VC3	6				1	3			2						
12.	VC8	8				1	3			2						
13.	VR24	25				8	8		2	2						
14.	VRC30	15	4			2	1			1						
15.	VRC40	17	4			1	2			2						
16.	VRC50	17	15			1	1			1						
17.	VXE6	8	9			1	1			1						
18.	VXN8	11	1			1	1			1						
19.	VP(SPEC DET)				7											
25.	CV 1			4				1	1							
26.	CV 2			4				1								
27.	CVN			4				1	2							
30.	ASWOC				2											
32.	6TH FLEET				1											
33.	7TH FLEET				1											
34.	PACMISRANFAC				4											
35.	NAS GTMO BAY				5											
36.	NAF SIGONELLA	5			14											
37.	NS KEFLAVIK				4											
38.	NAS CUBI POINT	3			8											
39.	NAS AGANA	3			3											
40.	NAF MISAWA				5											
42.	OTHERS				5											
43.	TRARON XO/CO									10						

APPENDIX D (CONT.)

PROP NFO SUBCOMMUNITY

NUMBER OF DISCRETE PROP&NFO OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VP	19	1			2	1			1						
2.	VAW(E2B)	10	2			1	1			1						
3.	VAW(E2C)	12	3				2			1						
4.	VQ1	23	9			1			1							
5.	VQ2	18	6			1	1		1							
6.	VQ3	18	9			1	1			1						
7.	VQ4	27	10			2	1			1						
8.	VC1(VR DET)	1				1										
10.	VC3	3	1			2				1						
13.	VR24	3														
16.	VRC50	3														
17.	VXE6	7	7			2				1						
18.	VXN8	9				1	1			1						
19.	VP(SPEC DET)	3	5			1										
25.	CV 1			2												
26.	CV 2			5												
27.	CVN			3				1								
29.	CARGRU				1											
30.	ASWOC				5											
31.	2ND FLEET				1											
32.	6TH FLEET				1											
33.	7TH FLEET								1							
42.	OTHERS				1											

APPENDIX D (CONT.)

JET PILOT SUBCOMMUNITY

NUMBER OF DISCRETE JET PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VF(F4)	9	2			1	1			1						
2.	VF(F14)	9	2			1	2			1						
3.	VAL	10				1	3			2						
4.	VAM	12	2			1	1			1						
5.	VAQ	3				1	1			1						
6.	VS	15				2	1			1						
7.	VQ1	6	3			1	1									
8.	VQ2	3	3			1										
9.	VC1	2				1	3			2						
10.	VC2	11	2			1	3									
11.	VC5	10	3				2									
13.	VC7	12				1	3			2						
14.	VC8	5					2			2						
15.	VC10	5	3													
16.	VR24	13				3	1									
17.	VRC30	8	3				1									
18.	VRC40	9	3			2	1									
19.	VRC50	5	5				1									
20.	VAQ33	14	9				3			1						
21.	VFP63	6				1	1			2						
25.	CV 1			6				2	3			2				
26.	CV 2			8				2	3			2				
27.	CVN			7				2	1			3				
28.	CRUDESGRU				1				1							
29.	CARGRU				2				1							
30.	CVW				1											
31.	2ND FLEET				1				1							
32.	3RD FLEET								2							
33.	6TH FLEET				1				1							
34.	7TH FLEET				1				2							
39.	OTHERS			2												
41.	PRS CO										7					

APPENDIX D (CONT.)

JET NFO SUBCOMMUNITY

NUMBER OF DISCRETE JETNFO OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VF(F4)	9	2				2			1						
2.	VF(F14)	10	2			1	1			1						
4.	VAW	12	2				2			1						
5.	VAQ	13	1			1	2			1						
6.	VS	14	3			1	2			1						
7.	VQ1	14	2			1	1			1						
8.	VQ2	15				1										
20.	VAQ33	11	19			1	2			1						
25.	CV 1			1				1								
26.	CV 2			3												
27.	CVN			5												
29.	CARGRU				1											
32.	3RD FLEET								1							
34.	7TH FLEET				1				1							
39.	OTHERS				1											

APPENDIX D (CONT.)

HELO PILOT SUBCOMMUNITY

NUMBER OF DISCRETE HELO PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	HS	14				1	3			2						
2.	HSL	30	9			3	3			2						
3.	HM	20				3	3			2						
4.	HS1 (SEA)	13	6			1										
5.	HC1 (SEA)	7	7			1				2						
6.	HC1 (DET2)	15				1										
7.	HC1 (DET6)	3				5										
8.	HC3 (SEA)	14				6				2						
9.	HC6 (SEA)	43	21			6				2						
10.	HC11 (SEA)	31	6			6	3			2						
11.	HC16 (SEA)	10	3			5										
12.	HCV4	18				6	3		1	2						
13.	HCV5	28					3		1	2						
15.	VC8	7	3													
16.	VR24	4	4				1									
17.	VXE6	6	2			1	2									
18.	TACRON 1					4										
19.	TACRON 21/22				1											
20.	LPD			1												
21.	LPH			4								2				
22.	LHA			5								1				
25.	CV2			1												
26.	CVN			1												
29.	PHIBRON				1											
31.	3RD FLEET								1							
32.	PACMISRANFAC	1			9											
33.	NAS GTMO BAY	1			7											
35.	NAS CUBI POINT	2			9											
36.	NAS AGANA	1			6											
38.	OTHER SAR	39			26											
39.	LAMPS MK III	39				15	3			2						
40.	OTHERS				2											
41.	TRARON XO/CO									4						
42.	FRS CO										6					
43.	MAJOR CMDS													4		
44.	SEQUENTIAL CMDS														3	

APPENDIX E

NONDISCRETE OPERATIONAL BILLETS

NUMBER OF NON-DISCRETE PROP OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
20.	TACRON 1				7											
25.	CV 1											1				
26.	CV 2											1				
28.	CRUDESGRU				1											
31.	2ND FLEET								1							
32.	6TH FLEET												1			
41.	NS ADAK				3											
42.	OTHERS				4											
43.	TRARON XO/CO									1						
44.	FRS CO										4					
45.	MAJOR CMDS													7		
46.	SEQUENTIAL CMDS														3	

NUMBER OF NON-DISCRETE JET OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
22.	TACRON 1				4											
23.	TACRON 21/22				2	1	1									
25.	CV 1										1	2			1	
26.	CV 2			1							1	2			1	
27.	CVN			1							1	2			1	
29.	CARGRU												1			
30.	CVW				1			2			1					
31.	2ND FLEET				1				1							
32.	3RD FLEET												1			
34.	7TH FLEET												1			
40.	TRARON XO/CO									3						
41.	FRS CO										11					
42.	MAJOR CMDS													14		

NUMBER OF NON-DISCRETE NFO OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/S	G6	H1	H2	H3	H4
11.	VC6	2								1						
24.	AVT			1												
25.	CV 1			2												
26.	CV 2			3												
28.	CRUDESGRU				1											
40.	NAF MISAWA				1											
42.	OTHERS				1											

NUMBER OF NON-DISCRETE PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/S	G6	H1	H2	H3	H4
14.	VC6	3								1						
23.	AVT			8				2	1			1				
24.	CV1			1					1							
25.	CV2			1				1								
26.	CVN			2					2							
33.	NAS GTMO BAY	1			2											
34.	NS KEFLAVIK				1											
40.	OTHERS				1											
41.	TRARON XO/CO									2						

NUMBER OF NON-DISCRETE AVIATION OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/S	G6	H1	H2	H3	H4
14.	VC6					2										
18.	TACRON 1					4				1						
19.	TACRON 21/22					3				2						
21.	LPH										1					
24.	CV1										1	3				
27.	CRUDESGRU															1
28.	CARGRU								1							
30.	2ND FLEET									1						
37.	NS ADAK				2											
40.	OTHERS				5											
42.	FRS CO										1					
43.	MAJOR CMDS													11		
44.	SEQUENTIAL CMDS														3	

APPENDIX F

APPORTIONED OPERATIONAL BILLETS

PROP PILOT SUBCOMMUNITY

NUMBER OF APPORTIONED PROP PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VP	30	1			2	2			1						
2.	VAW(E2B)	9				2	1			1						
3.	VAW(E2C)	7				1	1			1						
4.	VQ1	16	2			3				1						
5.	VQ2	20	2			2	2			1						
6.	VQ3	17	12			1	2			1						
7.	VQ4	34	10			3	2			1						
8.	VC1(VR DET)	3	3			2										
9.	VC2	1								2						
10.	VC3	6				1	3			2						
11.	VC6	1														
12.	VC8	8				1	3			2						
13.	VR24	25				8	8		2	2						
14.	VRC30	15	4			2	1			1						
15.	VRC40	17	4			1	2			2						
16.	VRC50	17	15			1	1			1						
17.	VXE6	8	9			1	1			1						
18.	VXN8	11	1			1	1			1						
19.	VP(SPEC DET)				7											
20.	TACRON 1				3	1										
21.	TACRON 21/22															
22.	LPD															
23.	LPH															
24.	AVT			2				1				1				
25.	CV 1			4				1	1			1				
26.	CV 2			4				1				1				
27.	CVN			5				1	3							
28.	CRUDESGRU															
29.	CARGRU															
30.	ASWOC				2											
31.	2ND FLEET								1							
32.	6TH FLEET				1								1			
33.	7TH FLEET				1											
34.	PACMISRANFAC				4											
35.	NAS GTMO BAY				6											
36.	NAF SIGONELLA	5			14											
37.	NS KEFLAVIK				4											
38.	NAS CUBI POINT	3			8											
39.	NAS AGANA	3			3											
40.	NAF MISAWA				5											
41.	NS ADAK				2											
42.	OTHERS				8											
43.	TRARON XO/CO									11						
44.	FRS CO										3					
45.	MAJOR CMDS													8		
46.	SEQUENTIAL CMDS														3	

APPENDIX F (CONT.)

PROP NFO SUBCOMMUNITY

NUMBER OF APPORTIONED PROPANFO OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VP	19	1			2	1			1						
2.	VAW(E2B)	10	2			1	1			1						
3.	VAW(E2C)	12	3				2			1						
4.	VQ1	23	9			1			1							
5.	VQ2	18	6			1	1		1							
6.	VQ3	18	9			1	1			1						
7.	VQ4	27	10			2	1			1						
8.	VC1(VR DET)	1				1										
9.	VC2															
10.	VC3	3	1			2				1						
11.	VC6	1														
12.	VC8															
13.	VR24	3														
14.	VRC30															
15.	VRC40															
16.	VRC50	3														
17.	VXE6	7	7			2				1						
18.	VXN8	9				1	1			1						
19.	VP(SPEC DET)	3	5			1										
20.	TACRON 1					1										
21.	TACRON 21/22					1										
22.	LPD															
23.	LPH															
24.	AVT															
25.	CV 1			3												
26.	CV 2			6												
27.	CVN			3				1								
28.	CRUDESGRU				1											
29.	CARGRU				1											
30.	ASWOC				5											
31.	2ND FLEET				1				1							
32.	6TH FLEET				1											
33.	7TH FLEET								1							
34.	PACMISRANFAC															
35.	NAS GTMO BAY															
36.	NAF SIGONELLA															
37.	NS KEFLAVIK															
38.	NAS CUBI POINT															
39.	NAS AGANA															
40.	NAF MISAWA															
41.	NS ADAK				2											
42.	OTHERS				5											
43.	TRARON XO/CO															
44.	FRS CO										2					
45.	MAJOR CMDS													3		
46.	SEQUENTIAL CMDS														1	

APPENDIX F (CONT.)

JET PILOT SUBCOMMUNITY

NUMBER OF APPORTIONED JET PILOT OPERATIONAL BILLETS BY ORGANIZATION TYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VF(F4)	9	2			1	1			1						
2.	VF(F14)	9	2			1	2			1						
3.	VAL	10				1	3			2						
4.	VAM	12	2			1	1			1						
5.	VAQ	3				1	1			1						
6.	VS	15				2	1			1						
7.	VQ1	6	3			1	1									
8.	VQ2	3	3			1										
9.	VC1	2				1	3			2						
10.	VC2	11	2			1	3									
11.	VC5	10	3				2									
12.	VC6	1														
13.	VC7	12				1	3			2						
14.	VC8	5					2			2						
15.	VC10	5	3													
16.	VR24	13				3	1									
17.	VRC30	8	3				1									
18.	VRC40	9	3			2	1									
19.	VRC50	5	5				1									
20.	VAQ33	14	9				3			1						
21.	VFP63	6				1	1			2						
22.	TACRON 1				1	1										
23.	TACRON 21/22				1	1	1			1						
24.	AVT			2				1				2				
25.	CV 1			6				2	3		1	3			1	
26.	CV 2			9				2	3		1	3			1	
27.	CVN			8				2	2		1	4			1	
28.	CRUDESGRU				1				1							
29.	CARGRU				2				1				1			
30.	CVW				1			1			1					
31.	2ND FLEET				1				2							
32.	3RD FLEET								2				1			
33.	6TH FLEET				1				1							
34.	7TH FLEET				1				2				1			
35.	NAS GTMO BAY				1											
36.	NS KEFLAVIK															
37.	NAF MISAWA															
38.	NS ADAK															
39.	OTHERS			2	1											
40.	TRARON XO/CO									3						
41.	FRS CO										15					
42.	MAJOR CMDS													16		
43.	SEQUENTIAL CMDS														1	

APPENDIX F (CONT.)

JET NFO SUBCOMMUNITY

NUMBER OF APPORTIONED JETNFO OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G8	H1	H2	H3	H4
1.	VF(F4)	9	2				2			1						
2.	VF(F14)	10	2			1	1			1						
3.	VAL															
4.	VAM	12	2				2			1						
5.	VAQ	13	1			1	2			1						
6.	VS	14	3			1	2			1						
7.	VQ1	14	2			1	1									
8.	VQ2	15				1										
9.	VC1															
10.	VC2															
11.	VC5															
12.	VC6	1								1						
13.	VC7															
14.	VC8															
15.	VC10															
16.	VR24															
17.	VRC30															
18.	VRC40															
19.	VRC50															
20.	VAQ33	11	19			1	2			1						
21.	VFP63															
22.	TACRON 1				3	1										
23.	TACRON 21/22				1	1										
24.	AVT			1												
25.	CV 1			2				1				1				
26.	CV 2			5								1				
27.	CVN			6								1				
28.	CRUDESGRU				1											
29.	CARGRU				1											
30.	CVW				1			1								
31.	2ND FLEET				1				1							
32.	3RD FLEET								1							
33.	6TH FLEET															
34.	7TH FLEET				1				1							
35.	NAS GTMO BAY															
36.	NS KEFLAVIK															
37.	NAF MISAWA				1											
38.	NS ADAK				1											
39.	OTHERS				3											
40.	TRARON XO/CO									1						
41.	FRS CO										4					
42.	MAJOR CMDS													4		
43.	SEQUENTIAL CMDS															

APPENDIX F (CONT.)

HELO PILOT SUBCOMMUNITY

NUMBER OF APPORTIONED HELO PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	HS	14				1	3			2						
2.	HSL	30	9			3	3			2						
3.	HM	20				3	3			2						
4.	HS1 (SEA)	13	6			1										
5.	HC1 (SEA)	7	7			1				2						
6.	HC1 (DET2)	15				1										
7.	HC1 (DET6)	3				5										
8.	HC3 (SEA)	14				6				2						
9.	HC6 (SEA)	43	21			6				2						
10.	HC11 (SEA)	31	6			6	3			2						
11.	HC16 (SEA)	10	3			5										
12.	HCV4	18				6	3		1	2						
13.	HCV5	28					3		1	2						
14.	VC6	1														
15.	VC8	7	3													
16.	VR24	4	4				1									
17.	VXE6	6	2			1	2									
18.	TACRON 1					5										
19.	TACRON 21/22				1	1										
20.	LPD			1												
21.	LPH			4								2				
22.	LHA			5								1				
23.	AVT			3				1								
24.	CV1															
25.	CV2			1												
26.	CVN			2												
27.	CRUDESGRU															
28.	CARGRU															
29.	PHIBRON				1											
30.	2ND FLEET															
31.	3RD FLEET								1							
32.	PACMISRANFAC	1			9											
33.	NAS GTMO BAY	1			8											
34.	NS KEFLAVIK															
35.	NAS CUBI POINT	2			9											
36.	NAS AGANA	1			6											
37.	NS ADAK															
38.	OTHER SAR	39			26											
39.	LAMPS MK III	39				15	3			2						
40.	OTHERS				4											
41.	TRARON XO/CO									4						
42.	FRS CO										6					
43.	MAJOR CMDS													5		
44.	SEQUENTIAL CMDS														3	

APPENDIX G

OFFICER INVENTORY BY GRADE AND YCS

INVENTORY OF PROPΔPILOT OFFICERS FOR 1981

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	6					
2.	167					
3.		286				
4.		167				
5.			277			
6.			199			
7.			187			
8.			120			
9.			60	10		
10.			6	68		
11.				50		
12.			2	55		
13.				109		
14.				125		
15.				82	31	
16.					65	
17.					62	
18.					53	
19.					40	
20.					46	
21.					27	
22.					21	21
23.						27
24.						50
25.						51
26.						54
27.						41
28.						38
29.						19
30.						16
31.						12

INVENTORY OF PROP&PILOT OFFICERS FOR 1982

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	167					
3.		300				
4.		309				
5.			163			
6.			233			
7.			126			
8.			115			
9.			83	10		
10.			9	50		
11.				54		
12.				42		
13.				50		
14.				102		
15.				102	16	
16.					84	
17.					63	
18.					59	
19.					51	
20.					36	
21.					37	2
22.						13
23.						25
24.						25
25.						45
26.						43
27.						50
28.						34
29.						28
30.						14
31.						16

INVENTORY OF PROP∆PILOT OFFICERS FOR 1983

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	187					
3.		316				
4.		326				
5.			300			
6.			137			
7.			147			
8.			77			
9.			82	6		
10.			13	67		
11.				40		
12.				46		
13.				38		
14.				47		
15.				93		
16.					87	
17.					81	
18.					59	
19.					57	
20.					46	
21.					30	
22.					14	21
23.						13
24.						23
25.						23
26.						39
27.						40
28.						41
29.						25
30.						21
31.						14

APPENDIX G (CONT.)

INVENTORY OF PROPAPILOT OFFICERS FOR 1984

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	187					
3.		330				
4.		342				
5.			317			
6.			252			
7.			87			
8.			90			
9.			57			
10.			14	66		
11.				53		
12.				34		
13.				42		
14.				36		
15.				43		
16.					58	
17.					85	
18.					77	
19.					57	
20.					51	
21.					31	5
22.					11	15
23.						21
24.						12
25.						21
26.						20
27.						36
28.						33
29.						30
30.						19
31.						21

INVENTORY OF PROP∆PILOT OFFICERS FOR 1985

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	7					
2.	187					
3.		330				
4.		355				
5.			332			
6.			266			
7.			160			
8.			53			
9.			69			
10.			19	32		
11.				53		
12.				45		
13.				31		
14.				40		
15.				33		
16.					23	
17.					67	
18.					80	
19.					74	
20.					51	
21.					37	7
22.					15	20
23.						15
24.						19
25.						11
26.						18
27.						18
28.						29
29.						24
30.						22
31.						19

INVENTORY OF PROPAPILOT OFFICERS FOR 1986

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	7					
2.	187					
3.		330				
4.		355				
5.			345			
6.			279			
7.			168			
8.			98			
9.			40			
10.			31	30		
11.			2	34		
12.				45		
13.				41		
14.				29		
15.				36		
16.					19	
17.					30	
18.					63	
19.					78	
20.					66	
21.					34	10
22.					17	22
23.						20
24.						14
25.						18
26.						10
27.						17
28.						15
29.						22
30.						18
31.						22

APPENDIX G (CONT.)

INVENTORY OF PROPANFO OFFICERS FOR 1981

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	66					
2.	177					
3.		159				
4.		74				
5.			173			
6.			163			
7.			135			
8.			150			
9.			95	16		
10.			6	81		
11.				66		
12.			4	71		
13.				70		
14.				56		
15.				20	9	
16.					56	
17.					47	
18.					44	
19.					39	
20.					29	
21.					25	
22.					3	11
23.						11
24.						8
25.						8
26.						11
27.						
28.						
29.						2
30.						
31.						

INVENTORY OF PROPANFO OFFICERS FOR 1982

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	74					
2.	195					
3.		228				
4.		153				
5.			67			
6.			141			
7.			137			
8.			113			
9.			121	15		
10.			17	90		
11.				71		
12.				61		
13.				68		
14.				68		
15.				48	7	
16.					22	
17.					55	
18.					45	
19.					42	
20.					37	
21.					22	1
22.						13
23.						13
24.						11
25.						8
26.						8
27.						11
28.						
29.						
30.						2
31.						

INVENTORY OF PROPΔNFO OFFICERS FOR 1983

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	72					
2.	199					
3.		243				
4.		219				
5.			140			
6.			55			
7.			118			
8.			115			
9.			94	8		
10.			21	110		
11.				80		
12.				66		
13.				58		
14.				67		
15.				65		
16.					42	
17.					22	
18.					53	
19.					43	
20.					40	
21.					29	
22.						13
23.						13
24.						13
25.						11
26.						8
27.						8
28.						11
29.						
30.						
31.						2

INVENTORY OF PROPANFO OFFICERS FOR 1984

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	72					
2.	197					
3.		246				
4.		234				
5.			200			
6.			114			
7.			46			
8.			100			
9.			100			
10.			17	85		
11.				98		
12.				73		
13.				63		
14.				57		
15.				64		
16.					42	
17.					42	
18.					21	
19.					50	
20.					40	
21.					26	4
22.						15
23.						13
24.						13
25.						13
26.						11
27.						8
28.						8
29.						11
30.						
31.						

INVENTORY OF PROPΔNFO OFFICERS FOR 1985

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	72					
2.	197					
3.		245				
4.		237				
5.			213			
6.			163			
7.			95			
8.			39			
9.			88			
10.			38	61		
11.				76		
12.				90		
13.				70		
14.				61		
15.				54		
16.					37	
17.					50	
18.					40	
19.					20	
20.					47	
21.					24	6
22.						17
23.						15
24.						13
25.						13
26.						13
27.						11
28.						8
29.						8
30.						11
31.						

APPENDIX G (CONT.)

INVENTORY OF PROPANFO OFFICERS FOR 1986

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	72					
2.	197					
3.		245				
4.		235				
5.			216			
6.			174			
7.			137			
8.			80			
9.			33			
10.			43	43		
11.			4	73		
12.				70		
13.				86		
14.				69		
15.				59		
16.					32	
17.					49	
18.					47	
19.					38	
20.					18	
21.					25	8
22.						18
23.						17
24.						15
25.						13
26.						13
27.						13
28.						11
29.						8
30.						8
31.						11

INVENTORY OF JET∆PILOT OFFICERS FOR 1981

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	6					
2.	168					
3.		288				
4.		173				
5.			304			
6.			272			
7.			171			
8.			97			
9.			70	12		
10.			5	65		
11.				49		
12.			4	90		
13.				147		
14.				136		
15.				131	51	
16.					135	
17.					89	
18.					96	
19.					74	
20.					89	
21.					56	
22.					11	37
23.						40
24.						56
25.						78
26.						82
27.						68
28.						66
29.						24
30.						17
31.						20

INVENTORY OF JETΔPILOT OFFICERS FOR 1982

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	6					
2.	163					
3.		293				
4.		305				
5.			168			
6.			278			
7.			177			
8.			116			
9.			59	8		
10.			10	54		
11.				51		
12.				42		
13.				83		
14.				142		
15.				112	18	
16.					137	
17.					129	
18.					87	
19.					94	
20.					68	
21.					78	3
22.						30
23.						43
24.						34
25.						52
26.						70
27.						76
28.						58
29.						48
30.						20
31.						17

INVENTORY OF JET PILOT OFFICERS FOR 1983

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	6					
2.	164					
3.		288				
4.		311				
5.			296			
6.			153			
7.			181			
8.			121			
9.			74	5		
10.			9	44		
11.				43		
12.				43		
13.				38		
14.				80		
15.				132		
16.					99	
17.					131	
18.					127	
19.					86	
20.					86	
21.					60	
22.					1	47
23.						29
24.						37
25.						32
26.						47
27.						65
28.						66
29.						42
30.						41
31.						20

INVENTORY OF JET PILOT OFFICERS FOR 1984

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	6					
2.	164					
3.		289				
4.		306				
5.			301			
6.			270			
7.			100			
8.			124			
9.			80			
10.			11	54		
11.				35		
12.				36		
13.				40		
14.				37		
15.				74		
16.					84	
17.					96	
18.					129	
19.					124	
20.					78	
21.					63	10
22.						32
23.						47
24.						25
25.						34
26.						28
27.						43
28.						56
29.						48
30.						36
31.						41

INVENTORY OF JET∆PILOT OFFICERS FOR 1985

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	6					
2.	166					
3.		291				
4.		308				
5.			297			
6.			275			
7.			176			
8.			68			
9.			83			
10.			25	40		
11.				43		
12.				30		
13.				33		
14.				39		
15.				34		
16.					42	
17.					96	
18.					94	
19.					126	
20.					113	
21.					52	13
22.						43
23.						32
24.						40
25.						23
26.						30
27.						26
28.						37
29.						41
30.						41
31.						36

INVENTORY OF JET PILOT OFFICERS FOR 1986

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	171					
3.		297				
4.		310				
5.			299			
6.			271			
7.			179			
8.			120			
9.			45			
10.			34	33		
11.			2	43		
12.				37		
13.				27		
14.				32		
15.				36		
16.					20	
17.					54	
18.					94	
19.					92	
20.					114	
21.					68	22
22.						40
23.						43
24.						27
25.						37
26.						21
27.						28
28.						23
29.						27
30.						35
31.						41

APPENDIX G (CONT.)

INVENTORY OF JETΔNFO OFFICERS FOR 1981

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	65					
2.	179					
3.		164				
4.		135				
5.			222			
6.			166			
7.			139			
8.			181			
9.			104	17		
10.			7	85		
11.				83		
12.			4	98		
13.				108		
14.				65		
15.				44	19	
16.					48	
17.					50	
18.					50	
19.					31	
20.					34	
21.					13	
22.					2	7
23.						6
24.						6
25.						6
26.						6
27.						2
28.						
29.						2
30.						1
31.						

APPENDIX G (CONT.)

INVENTORY OF JETANFO OFFICERS FOR 1982

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	65					
2.	179					
3.		226				
4.		157				
5.			122			
6.			204			
7.			150			
8.			121			
9.			148	18		
10.			19	100		
11.				78		
12.				75		
13.				89		
14.				104		
15.				53	9	
16.					51	
17.					48	
18.					50	
19.					50	
20.					31	
21.					33	1
22.						8
23.						8
24.						3
25.						6
26.						6
27.						6
28.						2
29.						
30.						2
31.						1

INVENTORY OF JET NFO OFFICERS FOR 1983

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	65					
2.	179					
3.		226				
4.		217				
5.			142			
6.			112			
7.			184			
8.			131			
9.			102	10		
10.			27	138		
11.				91		
12.				71		
13.				69		
14.				86		
15.				101		
16.					49	
17.					51	
18.					48	
19.					50	
20.					50	
21.					30	
22.						20
23.						8
24.						4
25.						3
26.						6
27.						6
28.						6
29.						2
30.						
31.						2

APPENDIX G (CONT.)

INVENTORY OF JETΔNFO OFFICERS FOR 1984

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	63					
2.	176					
3.		224				
4.		217				
5.			197			
6.			131			
7.			101			
8.			161			
9.			117			
10.			20	95		
11.				125		
12.				83		
13.				65		
14.				66		
15.				83		
16.					64	
17.					49	
18.					51	
19.					48	
20.					49	
21.					40	6
22.						17
23.						21
24.						4
25.						4
26.						3
27.						6
28.						6
29.						6
30.						2
31.						

INVENTORY OF JET∆NFO OFFICERS FOR 1985

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	63					
2.	174					
3.		221				
4.		215				
5.			197			
6.			181			
7.			118			
8.			88			
9.			145			
10.			45	74		
11.				87		
12.				114		
13.				76		
14.				62		
15.				64		
16.					47	
17.					77	
18.					49	
19.					51	
20.					47	
21.					36	9
22.						29
23.						17
24.						11
25.						4
26.						4
27.						3
28.						6
29.						6
30.						6
31.						2

APPENDIX G (CONT.)

INVENTORY OF JETANFO OFFICERS FOR 1986

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	62					
2.	173					
3.		219				
4.		213				
5.			195			
6.			181			
7.			163			
8.			103			
9.			79			
10.			74	72		
11.			5	91		
12.				79		
13.				104		
14.				73		
15.				60		
16.					37	
17.					63	
18.					77	
19.					49	
20.					50	
21.					31	11
22.						29
23.						29
24.						9
25.						11
26.						4
27.						4
28.						3
29.						6
30.						6
31.						6

APPENDIX G (CONT.)

INVENTORY OF HELO PILOT OFFICERS FOR 1981

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	5					
2.	131					
3.		226				
4.		125				
5.			138			
6.			112			
7.			131			
8.			164			
9.			84	15		
10.			9	116		
11.				106		
12.			11	136		
13.				80		
14.				69		
15.				73	28	
16.					57	
17.					34	
18.					34	
19.					30	
20.					18	
21.					21	
22.					3	10
23.						10
24.						12
25.						23
26.						10
27.						6
28.						5
29.						
30.						
31.						1

INVENTORY OF HELO PILOT OFFICERS FOR 1982

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	6					
2.	157					
3.		252				
4.		251				
5.			125			
6.			130			
7.			95			
8.			114			
9.			134	16		
10.			14	78		
11.				105		
12.				95		
13.				130		
14.				77		
15.				56	10	
16.					78	
17.					57	
18.					33	
19.					33	
20.					23	
21.					15	1
22.						10
23.						12
24.						10
25.						11
26.						19
27.						8
28.						4
29.						
30.						
31.						

INVENTORY OF HELO PILOT OFFICERS FOR 1983

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	6					
2.	157					
3.		285				
4.		278				
5.			251			
6.			118			
7.			110			
8.			83			
9.			95	9		
10.			23	119		
11.				71		
12.				95		
13.				90		
14.				125		
15.				75		
16.					53	
17.					78	
18.					54	
19.					32	
20.					26	
21.					20	
22.						9
23.						10
24.						12
25.						9
26.						9
27.						14
28.						5
29.						
30.						
31.						

INVENTORY OF HELO PILOT OFFICERS FOR 1984

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	189					
3.		313				
4.		315				
5.			278			
6.			236			
7.			100			
8.			97			
9.			72			
10.			18	86		
11.				108		
12.				64		
13.				90		
14.				87		
15.				122		
16.					49	
17.					54	
18.					74	
19.					53	
20.					25	
21.					19	3
22.						10
23.						9
24.						10
25.						10
26.						7
27.						7
28.						9
29.						
30.						
31.						

APPENDIX G (CONT.)

INVENTORY OF HELO PILOT OFFICERS FOR 1985

YCS	*ENS*	*LTJG*	*LT*	*LCDR*	*CDR*	*CAPT*
1.	7					
2.	190					
3.		335				
4.		343				
5.			315			
6.			262			
7.			200			
8.			87			
9.			86			
10.			27	44		
11.				79		
12.				97		
13.				61		
14.				87		
15.				84		
16.					70	
17.					58	
18.					51	
19.					72	
20.					41	
21.					16	4
22.						12
23.						10
24.						9
25.						9
26.						9
27.						5
28.						5
29.						
30.						
31.						

INVENTORY OF HELO PILOT OFFICERS FOR 1986

YCS	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	7					
2.	190					
3.		336				
4.		365				
5.			343			
6.			297			
7.			222			
8.			176			
9.			78			
10.			42	41		
11.			3	54		
12.				71		
13.				93		
14.				59		
15.				84		
16.					50	
17.					94	
18.					55	
19.					50	
20.					56	
21.					24	8
22.						11
23.						12
24.						10
25.						8
26.						8
27.						7
28.						4
29.						
30.						
31.						

APPENDIX H

TOTAL BILLET REQUIREMENTS

PROP COMMUNITY

PILOTS

NUMBER OF PROPΔPILOT SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	1022	86	59	84	92	86	16	12	66	3	7	1	8	3	2
1982	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1983	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1984	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1985	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1986	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2
1981-85	1022	86	62	84	92	86	17	14	66	3	7	1	8	3	2
1982-86	1022	86	63	84	92	86	17	15	66	3	7	1	8	3	2

NFO's

NUMBER OF PROPΔNFO SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	708	103	69	68	66	48	2	4	42	2	5		3	1	1
1982	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1983	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1984	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1985	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1986	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1981-85	708	103	72	68	66	48	3	4	42	2	5		3	1	1
1982-86	708	103	72	68	66	48	3	4	42	2	5		3	1	1

JET COMMUNITY

PILOTS

NUMBER OF JET∆PILOT SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	902	106	111	44	104	167	44	61	117	33	48	6	16	13	4
1982	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4
1983	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4
1984	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4
1985	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4
1986	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4
1981-85	902	106	117	44	104	167	46	63	117	33	51	6	16	14	4
1982-86	902	106	118	44	104	167	46	63	117	33	52	6	16	14	4

NFO's

NUMBER OF JET∆NFO SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	688	135	64	27	41	99	12	4	60	12	9	2	4	1	
1982	688	135	69	27	41	99	12	4	60	12	9	2	4	1	
1983	688	135	69	27	41	99	12	4	60	12	9	2	4	1	
1984	688	135	69	27	41	99	12	4	60	12	9	2	4	1	
1985	688	135	69	27	41	99	12	4	60	12	9	2	4	1	
1986	688	135	64	27	41	99	12	4	60	12	9	2	4	1	
1981-85	688	135	68	27	41	99	12	4	60	12	9	2	4	1	
1982-86	688	135	68	27	41	99	12	4	60	12	9	2	4	1	

APPENDIX H (CONT.)

HELO COMMUNITY

PILOTS

NUMBER OF HELO PILOT SEA BILLETS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	572	106	88	67	73	63	4	4	51	7	20		5	3	1
1982	572	106	90	67	73	63	4	4	51	7	20		5	3	1
1983	590	106	90	67	79	66	4	5	53	7	20		5	3	1
1984	657	106	90	67	94	72	4	6	57	7	20		5	3	1
1985	696	106	90	67	109	75	4	6	59	7	20		5	3	1
1986	735	106	90	67	124	78	4	6	61	7	20		5	3	1
1981-85	618	106	89	67	86	68	4	5	55	7	20		5	3	1
1982-86	650	106	90	67	96	71	4	6	57	7	20		5	3	1

APPENDIX I

TOTAL OFFICERS AVAILABLE

PROP COMMUNITY

PILOTS

NUMBER OF PROP∆PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	730	446	59	85	141	140	28	21	110	16	46	6	71	60	45
1982	772	417	65	87	92	109	31	26	117	13	45	4	46	50	38
1983	942	323	72	96	77	76	24	30	133	17	49	3	33	35	27
1984	989	384	59	78	64	53	12	35	150	19	53	3	30	23	18
1985	1017	453	51	69	70	45	11	32	146	19	57	3	31	17	12
1986	1030	496	43	58	73	47	10	20	105	24	65	3	31	16	12
1981-85	890	404	61	83	89	85	21	29	131	17	50	4	42	37	28
1982-86	950	414	58	78	75	66	18	29	130	18	54	3	34	28	21

NFO's

NUMBER OF PROP∆NFO OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	406	103	72	71	127	62	2	10	97	11	34	2	17	11	8
1982	448	111	80	75	119	79	6	11	106	14	38	2	22	9	7
1983	602	108	73	69	118	82	7	9	84	15	43	2	24	11	8
1984	680	93	65	61	125	80	6	7	76	15	42	2	24	14	10
1985	695	77	51	48	147	80	6	10	88	17	44	2	26	15	11
1986	696	59	38	35	139	92	6	11	101	7	27	3	29	15	11
1981-85	566	98	68	65	128	76	5	10	90	14	40	2	23	12	9
1982-86	624	90	61	58	130	82	6	10	91	14	39	2	25	13	10

APPENDIX I (CONT.)

JET COMMUNITY

PILOTS

NUMBER OF JET∆PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	740	285	109	43	168	209	55	73	131	51	84	28	68	125	35
1982	741	310	95	36	96	165	54	87	152	42	89	22	55	97	25
1983	818	311	96	36	70	113	48	104	176	50	88	19	47	63	16
1984	870	241	106	39	57	71	25	90	165	50	91	21	51	49	13
1985	871	261	108	40	49	53	16	76	145	67	104	21	51	42	11
1986	876	316	82	30	52	46	15	59	111	63	108	20	50	46	12
1981-85	808	282	103	39	88	122	40	86	154	52	91	22	54	75	20
1982-86	835	288	97	36	65	90	31	83	150	54	96	21	51	59	15

NFO's

NUMBER OF JET∆NFO OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	521	164	82	36	138	137	12	7	103	25	20	3	9	9	3
1982	505	182	97	38	115	152	17	7	108	25	31	3	8	10	2
1983	585	180	88	35	103	147	22	7	109	37	37	3	9	7	2
1984	638	165	86	34	111	124	18	7	109	36	41	7	18	6	1
1985	633	162	84	33	144	121	15	9	134	35	38	8	20	6	2
1986	627	150	65	28	119	146	15	10	147	37	36	11	27	12	3
1981-85	576	171	88	35	122	136	17	7	113	32	34	5	13	8	2
1982-86	598	168	84	34	118	138	17	8	121	34	37	7	16	8	2

HELO COMMUNITY

PILOTS

NUMBER OF HELO∆PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	489	272	122	93	197	102	7	6	71	8	27		17	22	14
1982	628	245	133	100	185	121	6	8	91	10	28		17	12	21
1983	814	243	115	87	177	131	9	14	127	11	32		17	10	10
1984	906	353	89	67	139	133	10	15	129	12	33		14	11	9
1985	993	477	86	64	158	99	7	13	118	18	45		15	10	10
1986	1044	550	101	76	146	98	6	17	148	22	56		17	9	9
1981-85	766	318	109	82	171	117	8	11	107	12	33		16	13	13
1982-86	877	374	105	79	161	116	8	14	123	14	39		16	10	12

APPENDIX J

OPERATIONAL TOUR OPPORTUNITIES

PROP COMMUNITY

PILOTS

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROP△PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(29)	19	99	99	66	61	57	56	60	17	16	11	11	5	5
1982	(24)	21	97	97	(1)	79	55	55	57	20	16	17	17	6	6
1983	(8)	27	88	88	(17)	(12)	73	48	49	16	15	23	23	9	9
1984	(3)	22	(7)	(7)	(31)	(38)	(27)	42	44	15	14	25	25	14	14
1985	(1)	19	(19)	(19)	(24)	(47)	(37)	46	45	14	13	24	24	19	19
1986	99	17	(32)	(32)	(21)	(46)	(40)	72	63	11	11	24	24	20	20
1981-85	(13)	21	(2)	(2)	(4)	(2)	80	49	50	16	15	18	18	9	9
1982-86	(7)	21	(8)	(8)	(19)	(23)	97	51	51	15	14	22	22	11	11

NFO's

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROP△NFO OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(43)	100	96	96	52	77	91	42	44	17	15	20	20	9	9
1982	(37)	93	90	90	55	61	53	38	40	14	13	16	16	11	11
1983	(15)	96	99	99	55	59	44	51	50	13	11	15	15	9	9
1984	(4)	(9)	(10)	(10)	52	60	46	61	55	13	12	15	15	7	7
1985	(2)	(26)	(29)	(29)	44	60	51	42	48	12	11	14	14	7	7
1986	(2)	(43)	(48)	(48)	47	52	46	40	42	26	19	12	12	7	7
1981-85	(20)	(5)	(5)	(4)	51	63	52	46	47	13	12	15	15	8	8
1982-86	(12)	(13)	(15)	(15)	51	58	48	45	47	14	13	14	14	8	8

APPENDIX J (CONT.)

JET COMMUNITY

PILOTS

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JETΔPILOT OFFICERS IN PERCENTAGE

YEAR	*A*	*C*	*C1*	*C2*	*E*	*E1*	*E2*	*G1*	*G2/3*	*G4/5*	*G6*	*H1*	*H2*	*H3*	*H4*
1981	(18)	37	(2)	(2)	62	80	79	84	90	64	57	23	23	11	11
1982	(18)	34	(19)	(19)	(7)	(1)	86	73	77	79	59	29	29	15	15
1983	(9)	34	(19)	(19)	(33)	(32)	96	61	67	67	59	34	34	22	22
1984	(4)	44	(11)	(11)	(45)	(57)	(45)	70	71	66	57	31	31	29	29
1985	(3)	41	(9)	(9)	(53)	(68)	(66)	83	81	50	50	31	31	34	34
1986	(3)	34	(31)	(31)	(50)	(72)	(68)	(6)	(5)	53	48	32	32	31	31
1981-85	(10)	38	(12)	(12)	(15)	(27)	(13)	73	76	64	56	29	29	19	18
1982-86	(7)	37	(18)	(18)	(38)	(46)	(32)	76	78	61	54	31	31	24	24

NFO's

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JETΔNFO OFFICERS IN PERCENTAGE

YEAR	*A*	*C*	*C1*	*C2*	*E*	*E1*	*E2*	*G1*	*G2/3*	*G4/5*	*G6*	*H1*	*H2*	*H3*	*H4*
1981	(24)	82	77	77	30	73	100	51	58	46	42	44	44	14	14
1982	(27)	74	72	72	36	65	71	52	55	47	29	48	48	15	15
1983	(15)	75	79	79	40	67	56	52	55	32	25	44	44	20	20
1984	(7)	82	80	80	37	80	70	51	55	33	22	21	21	26	26
1985	(8)	83	82	82	28	82	84	41	44	33	24	19	19	23	23
1986	(9)	90	98	98	35	68	81	37	41	31	23	14	14	11	11
1981-85	(16)	79	78	78	34	73	73	49	53	37	27	30	30	19	19
1982-86	(13)	80	81	81	35	72	71	46	49	34	25	23	23	18	17

APPENDIX J (CONT.)

HELO COMMUNITY

PILOTS

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE HELO PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(15)	39	72	72	37	62	51	66	72	92	75		32	15	6
1982	91	43	67	67	40	52	58	50	56	75	72		30	28	4
1983	73	44	78	78	45	50	42	36	42	69	63		32	32	8
1984	73	30	(1)	(1)	68	54	38	41	45	63	60		36	30	9
1985	70	22	(5)	(5)	69	76	53	49	50	41	45		35	34	8
1986	70	19	89	89	85	80	61	37	42	34	36		30	36	9
1981-85	81	33	82	82	50	58	47	46	51	63	61		33	25	6
1982-86	74	28	86	86	60	61	49	42	46	51	52		32	32	7

APPENDIX K

BILLET RATES

PROP COMMUNITY

PILOTS

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR PROPΔPILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	341	34	29	42	37	34	8	6	26	2	4		4	2	1
1982	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1983	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1984	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1985	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1986	341	34	32	42	37	34	9	7	26	2	4		4	2	1
1981-85	341	34	31	42	37	34	8	7	26	2	4		4	2	1
1982-86	341	34	32	42	37	34	9	7	26	2	4		4	2	1

NFO's

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR PROPΔNFO OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	236	41	35	34	26	19	1	2	17	1	2		2		
1982	236	41	36	34	26	19	2	2	17	1	2		2		
1983	236	41	36	34	26	19	2	2	17	1	2		2		
1984	236	41	36	34	26	19	2	2	17	1	2		2		
1985	236	41	36	34	26	19	2	2	17	1	2		2		
1986	236	41	36	34	26	19	2	2	17	1	2		2		
1981-85	236	41	36	34	26	19	1	2	17	1	2		2		
1982-86	236	41	36	34	26	19	2	2	17	1	2		2		

APPENDIX K (CONT.)

JET COMMUNITY

PILOTS

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR JET∆PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	301	42	55	22	42	67	22	31	47	22	24	3	8	7	2
1982	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2
1983	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2
1984	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2
1985	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2
1986	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2
1981-85	301	42	58	22	42	67	23	31	47	22	26	3	8	7	2
1982-86	301	42	59	22	42	67	23	32	47	22	26	3	8	7	2

NFO's

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR JET∆NFO OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	229	54	32	14	16	40	6	2	24	8	4	1	2	1	
1982	229	54	35	14	16	40	6	2	24	8	5	1	2	1	
1983	229	54	35	14	16	40	6	2	24	8	5	1	2	1	
1984	229	54	35	14	16	40	6	2	24	8	5	1	2	1	
1985	229	54	35	14	16	40	6	2	24	8	5	1	2	1	
1986	229	54	32	14	16	40	6	2	24	8	4	1	2	1	
1981-85	229	54	34	14	16	40	6	2	24	8	5	1	2	1	
1982-86	229	54	34	14	16	40	6	2	24	8	5	1	2	1	

APPENDIX K (CONT.)

HELO COMMUNITY

PILOTS

BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR HELO PILOT OFFICERS

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	191	42	44	34	29	25	2	2	21	5	10		3	2	
1982	191	42	45	34	29	25	2	2	21	5	10		3	2	
1983	197	42	45	34	32	26	2	3	21	5	10		3	2	
1984	219	42	45	34	38	29	2	3	23	5	10		3	2	
1985	232	42	45	34	44	30	2	3	24	5	10		3	2	
1986	245	42	45	34	50	31	2	3	25	5	10		3	2	
1981-85	206	42	45	34	34	27	2	3	22	5	10		3	2	
1982-86	217	42	45	34	38	28	2	3	23	5	10		3	2	

APPENDIX L

APPORTIONMENT ALGORITHMS

The following algorithms are used to apportion the nondiscrete billet requirements among the indicated aviation subcommunities:

Prop Pilot Subcommunity

$$
\begin{aligned}
b(\text{apportioned}) = {} & b(\text{discrete prop pilot}) \\
& + \frac{N_1}{N_1+N_2}\, b(\text{nondiscrete prop}) \\
& + \frac{N_1}{N_1+N_3+N_5}\, b(\text{nondiscrete pilot}) \\
& + \frac{N_1}{N}\, b(\text{nondiscrete aviator})
\end{aligned}
$$

Prop NFO Subcommunity

$$
\begin{aligned}
b(\text{apportioned}) = {} & b(\text{discrete prop NFO}) \\
& + \frac{N_2}{N_1+N_2}\, b(\text{nondiscrete prop}) \\
& + \frac{N_2}{N_2+N_4}\, b(\text{nondiscrete NFO}) \\
& + \frac{N_2}{N}\, b(\text{nondiscrete aviator})
\end{aligned}
$$

Jet Pilot Subcommunity

$$b(\text{apportioned}) = b(\text{discrete jet pilot}) + \frac{N_3}{N_3+N_4}\, b(\text{nondiscrete jet}) + \frac{N_3}{N_1+N_3+N_5}\, b(\text{nondiscrete pilot}) + \frac{N_3}{N}\, b(\text{nondiscrete aviator})$$

Jet NFO Subcommunity

$$b(\text{apportioned}) = b(\text{discrete jet NFO}) + \frac{N_4}{N_3+N_4}\, b(\text{discrete jet NFO}) + \frac{N_4}{N_2+N_4}\, b(\text{nondiscrete NFO}) + \frac{N_4}{N}\, b(\text{nondiscrete aviator})$$

Helo Pilot Subcommunity

$$b(\text{apportioned}) = b(\text{discrete helo pilot}) + \frac{N_5}{N_1+N_3+N_5}\, b(\text{nondiscrete pilot}) + \frac{N_5}{N}\, b(\text{nondiscrete aviator})$$

where:

b(discrete prop pilot) = the number of discrete prop pilot billets for the applicable tour

b(nondiscrete prop) = the number of nondiscrete prop community billets for the applicable tour

b(nondiscrete pilot) = the number of nondiscrete pilot billets for the applicable tour

b(nondiscrete aviator) = the number of nondiscrete aviator billets for the applicable tour

and where:

N_1 = the average number of prop pilot officers eligible to fill the specified tour's billet requirements

N_2 = the average number of prop NFO's eligible to fill the specified tour's billet requirements

N_3 = the average number of jet pilots eligible to fill the specified tour's billet requirements

N_4 = the average number of jet NFO's eligible to fill the specified tour's billet requirements

N_5 = the average number of helo pilots eligible to fill the specified tour's billet requirements

$N = N_1+N_2+N_3+N_4+N_5$ = the average total number of Aviation Warfare Officers eligible to fill the specified tour's billet requirements

APPENDIX M

BILLET REQUIRMENT ALTERATIONS

CHANGE I

(JET PILOTS)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      1

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      10
                        CURRENT NUMBERS
                        ------- -------
NO.  ORGANIZATION         1981  1982  1983  1984  1985  1986
---  ------------         ----  ----  ----  ----  ----  ----
10.  VC2                     1     1     1     1     1     1

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
□:
      0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      12
                        CURRENT NUMBERS
                        ------- -------
NO.  ORGANIZATION         1981  1982  1983  1984  1985  1986
---  ------------         ----  ----  ----  ----  ----  ----
12.  VC6                     1     1     1     1     1     1

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
□:
      0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      13
                        CURRENT NUMBERS
                        ------- -------
NO.  ORGANIZATION         1981  1982  1983  1984  1985  1986
---  ------------         ----  ----  ----  ----  ----  ----
13.  VC7                     1     1     1     1     1     1

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
□:
      0 0 0 0 0 0
```

```
TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      0

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
      3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JETΔPILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(16)	37	(2)	(2)	60	77	77	83	89	64	57	23	23	11	11
1982	(16)	34	(19)	(19)	(5)	98	84	72	76	78	59	29	29	15	15
1983	(7)	33	(19)	(19)	(31)	(30)	94	60	66	67	59	34	34	22	22
1984	(1)	43	(11)	(11)	(44)	(56)	(43)	69	70	66	57	31	31	29	29
1985	(1)	40	(9)	(9)	(52)	(67)	(65)	82	80	50	50	31	31	34	34
1986	100	33	(31)	(31)	(48)	(71)	(67)	(4)	(4)	53	48	32	32	31	31
1981-85	(8)	37	(12)	(12)	(13)	(25)	(11)	72	75	63	56	29	29	19	18
1982-86	(5)	36	(18)	(18)	(36)	(45)	(30)	75	77	61	54	31	31	24	24

CHANGE II

(JET PILOTS)

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
3
BILLET MATRIX OPTIONS: JET∆PILOT -1 /JET-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
25

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
25.	CV 1	0	0	6	0	0	0	2	3	0	0	2	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 3 0 0 0 2 3 0 0 2 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
26

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
26.	CV 2	0	0	8	0	0	0	2	3	0	0	2	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 5 0 0 0 2 3 0 0 2 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
27

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
27.	CVN	0	0	7	0	0	0	2	1	0	0	3	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 4 0 0 0 2 1 0 0 3 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX?   ANSWER YES OR N (NO)!
NO

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
3

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JET∆PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(18)	37	76	76	62	80	79	84	90	64	57	23	23	11	11
1982	(18)	34	92	92	(7)	(1)	86	73	77	79	59	29	29	15	15
1983	(9)	34	91	91	(33)	(32)	96	61	67	67	59	34	34	22	22
1984	(4)	44	83	83	(45)	(57)	(45)	70	71	66	57	31	31	29	29
1985	(3)	41	81	81	(53)	(68)	(66)	83	81	50	50	31	31	34	34
1986	(3)	34	(7)	(7)	(50)	(72)	(68)	(6)	(5)	53	48	32	32	31	31
1981-85	(10)	38	84	84	(15)	(27)	(13)	73	76	64	56	29	29	19	18
1982-86	(7)	37	90	90	(38)	(46)	(32)	76	78	61	54	31	31	24	24

CHANGE III

(JET NFO's)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      3
BILLET MATRIX OPTIONS:  JET∆NFO   -1 /JET-2 /NFO-3 /AVIATION-4 /APPORTIONED-5
□:
      1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      25
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3  G4/5  G6  H1  H2  H3  H4

25.  CV 1                0   0   1   0   0   0   1   0   0     0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 4 0 0 0 1 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      26
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3  G4/5  G6  H1  H2  H3  H4

26.  CV 2                0   0   3   0   0   0   0   0   0     0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 6 0 0 0 0 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      27
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3  G4/5  G6  H1  H2  H3  H4

27.  CVN                 0   0   5   0   0   0   0   0   0     0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 8 0 0 0 0 0 0 0 0 0 0 0 0
```

```
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      0

DO YOU WANT TO MAKE CHANGES IN ANY-OTHER BILLET MATRIX?   ANSWER YES OR N (NO)!
NO

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
      3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JETΔINFO OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(24)	98	93	93	30	73	100	51	58	46	42	44	44	14	14
1982	(27)	89	86	86	36	65	71	52	55	47	29	48	48	15	15
1983	(15)	90	95	95	40	67	56	52	55	32	25	44	44	20	20
1984	(7)	99	97	97	37	80	70	51	55	33	22	21	21	26	26
1985	(8)	100	99	99	28	82	84	41	44	33	24	19	19	23	23
1986	(9)	(7)	(15)	(15)	35	68	81	37	41	31	23	14	14	11	11
1981-85	(16)	95	94	94	34	73	73	49	53	37	27	30	30	19	19
1982-86	(13)	97	98	98	35	72	71	46	49	34	25	23	23	18	17

CHANGE IV

(JET PILOTS)

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
3
BILLET MATRIX OPTIONS: JETΔPILOT -1 /JET-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
25

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
25.	CV 1	0	0	6	0	0	0	2	3	0	0	2	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 0 0 0 0 2 3 0 0 2 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
26

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
26.	CV 2	0	0	8	0	0	0	2	3	0	0	2	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 0 0 0 0 2 3 0 0 2 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
27

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
27.	CVN	0	0	7	0	0	0	2	1	0	0	3	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 0 0 0 0 2 1 0 0 3 0 0 0 0

CHANGE IV (CONT.)

```
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX?   ANSWER YES OR N (NO)!
YES
BILLET MATRIX OPTIONS:  JET&PILOT -1 /JET-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
□:
      4
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      25
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3 G4/5  G6  H1  H2  H3  H4

25.  CV 1                0   0   0   0   0   0   0   0   0    0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS.(SEPARATED BY BLANK SPACES)
□:
      0 0 6 0 0 0 0 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      26
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3 G4/5  G6  H1  H2  H3  H4

26.  CV 2                0   0   0   0   0   0   0   0   0    0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 8 0 0 0 0 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      27
                              CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION        A   C   C1  C2  E   E1  E2  G1  G2/3 G4/5  G6  H1  H2  H3  H4

27.  CVN                 0   0   0   0   0   0   0   0   0    0     0   0   0   0   0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 7 0 0 0 0 0 0 0 0 0 0 0 0
```

```
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX?   ANSWER YES OR N (NO)!
NO

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
      3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JET∆PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(18)	37	47	47	62	80	79	84	90	64	57	23	23	11	11
1982	(18)	34	56	56	(7)	(1)	86	73	77	79	59	29	29	15	15
1983	(9)	34	56	56	(33)	(32)	96	61	67	67	59	34	34	22	22
1984	(4)	44	51	51	(45)	(57)	(45)	70	71	66	57	31	31	29	29
1985	(3)	41	50	50	(53)	(68)	(66)	83	81	50	50	31	31	34	34
1986	(3)	34	65	65	(50)	(72)	(68)	(6)	(5)	53	48	32	32	31	31
1981-85	(10)	38	52	51	(15)	(27)	(13)	73	76	64	56	29	29	19	18
1982-86	(7)	37	55	55	(38)	(46)	(32)	76	78	61	54	31	31	24	24

CHANGE V

(PROP PILOTS)

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
3
BILLET MATRIX OPTIONS: PROP&PILOT-1 /PROP-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
1

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VP	30	1	0	0	2	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
27 1 0 0 2 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
2

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
2.	VAW(E2B)	9	0	0	0	2	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
8 0 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
3

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
3.	VAW(E2C)	7	0	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
6 0 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
4

CHANGE V. (CONT.)

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
4.	VQ1	16	2	0	0	3	0	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
U:
14 2 0 0 2 0 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

U:
5

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
5.	VQ2	20	2	0	0	2	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
U:
18 2 0 0 2 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

U:
6

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
6.	VQ3	17	12	0	0	1	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
U:
15 12 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

U:
7

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
7.	VQ4	34	10	0	0	3	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
U:
32 10 0 0 1 2 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

U:
10

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
10.	VC3	6	0	0	0	1	3	0	0	2	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
4 0 0 0 1 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
12

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
12.	VC8	8	0	0	0	1	3	0	0	2	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
7 0 0 0 1 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
13

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
13.	VR24	25	0	0	0	8	3	0	2	2	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
21 0 0 0 7 7 0 2 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
14

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
14.	VRC30	15	4	0	0	2	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
14 4 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
15

CHANGE V (CONT.)

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
15.	VRC40	17	4	0	0	1	2	0	0	2	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
16 4 0 0 0 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
16

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
16.	VRC50	17	15	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
14 15 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
17

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
17.	VXE6	8	9	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
6 9 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
18

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
18.	VXN8	11	1	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
9 1 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX? ANSWER YES OR N (NO)!
NO

```
DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      1

DISPLAY OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5/TOTAL INV-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      3

BILLET MATRIX OPTIONS:  PROP&PILOT-1 /PROP-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
      1
```

NUMBER OF DISCRETE PROP&PILOT OPERATIONAL BILLETS BY ORGANIZATIONTYPE

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VP	27	1			2	1			1						
2.	VAW(E2B)	8				1	1			1						
3.	VAW(E2C)	6					1			1						
4.	VQ1	14	2			2				1						
5.	VQ2	18	2			2	1			1						
6.	VQ3	15	12			1	1			1						
7.	VQ4	32	10			1	2			1						
8.	VC1(VR DET)	3	3			2										
9.	VC2	1								2						
10.	VC3	4				1	2			2						
12.	VC8	7				1	2			2						
13.	VR24	21				7	7		2	2						
14.	VRC30	14	4			1	1			1						
15.	VRC40	16	4				2			2						
16.	VRC50	14	15				1			1						
17.	VXE6	6	9				1			1						
18.	VXN8	9	1				1			1						
19.	VP(SPEC DET)				7											
25.	CV 1			4				1	1							
26.	CV 2			4				1								
27.	CVN			4				1	2							
30.	ASWOC				2											
32.	6TH FLEET				1											
33.	7TH FLEET				1											
34.	PACMISRANFAC				4											
35.	NAS GTMO BAY				5											
36.	NAF SIGONELLA	5			14											
37.	NS KEFLAVIK				4											
38.	NAS CUBI POINT	3			8											
39.	NAS AGANA	3			3											
40.	NAF MISAWA				5											
42.	OTHERS				5											
43.	TRARONS XO/CO									10						

```
DO YOU WANT ANY OTHER BILLET MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
```

```
DISPLAY OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5/TOTAL INV-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

□:
      3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROPAPILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(20)	19	99	99	49	45	42	56	60	17	16	11	11	5	5
1982	(16)	21	97	97	76	58	40	55	57	20	16	17	17	6	6
1983	97	27	88	88	91	83	53	48	49	16	15	23	23	9	9
1984	92	22	(7)	(7)	(8)	(16)	(1)	42	44	15	14	25	25	14	14
1985	90	19	(19)	(19)	100	(28)	(14)	46	45	14	13	24	24	19	19
1986	89	17	(32)	(32)	96	(26)	(18)	72	63	11	11	24	24	20	20
1981-85	(3)	21	(2)	(2)	78	.75	59	49	50	16	15	18	18	9	9
1982-86	96	21	(8)	(8)	93	96	71	51	51	15	14	22	22	11	11

APPENDIX N

TOUR POSITION ALTERATIONS

CHANGE VI

(JET NFO's)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
Q:
      2

DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
YES
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                BEGIN LENGTH
---  ----   ----                ----- ------

 1.  A      1ST OPERATIONAL      2.00   3.00
 2.  C      SUBS OPER SQD        7.50   2.50
 3.  C1     SUBS OPER SHIP       7.50   2.00
 4.  C2     SUBS OPER STAFF      7.50   2.00
 5.  E      SQD OPER NON-DH     11.00   2.50
 6.  E1     SQD OPER DH         12.00   2.50
 7.  E2     SHP OPER SR.O4      13.00   2.00
 8.  G1     OPER CDR            16.00   2.00
 9.  G2/3   SQD OPER XO/CO      16.00   2.50
10.  G4/5   S.C.I.G.            18.50   1.50
11.  G6     SHP OPER DH         18.50   2.00
12.  H1     OPER CAPT           22.00   2.00
13.  H2     MAJ SEA CMD         22.00   2.00
14.  H3     SEQ SEA CMD         24.00   2.00
15.  H4     POST MAJ CMD        24.00   2.00

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
  TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

Q:
      1
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                BEGIN LENGTH
---  ----   ----                ----- ------

 1.  A      1ST OPERATIONAL      2.00   3.00

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
Q:
      2 4

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
  TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

Q:
      0

DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!

YES
```

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	4.00
2.	C	SUBS OPER SQD	7.50	2.50
3.	C1	SUBS OPER SHIP	7.50	2.00
4.	C2	SUBS OPER STAFF	7.50	2.00
5.	E	SQD OPER NON-DH	11.00	2.50
6.	E1	SQD OPER DH	12.00	2.50
7.	E2	SHP OPER SR.O4	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

DO YOU WANT TO MAKE THESE CHANGES PERMANENT? ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
3

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JET&NFO OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	100	82	77	77	30	73	100	51	58	46	42	44	44	14	14
1982	97	74	72	72	36	65	71	52	55	47	29	48	48	15	15
1983	99	75	79	79	40	67	56	52	55	32	25	44	44	20	20
1984	89	82	80	80	37	80	70	51	55	33	22	21	21	26	26
1985	85	83	82	82	28	82	84	41	44	33	24	19	19	23	23
1986	85	90	98	98	35	68	81	37	41	31	23	14	14	11	11
1981-85	94	79	78	78	34	73	73	49	53	37	27	30	30	19	19
1982-86	91	80	81	81	35	72	71	46	49	34	25	23	23	18	17

CHANGE VII

(PROP PILOTS)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      2

DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
NO

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      5
          TOUR POSITION INDICATORS
          ---- -------- ----------
NO.  CODE   NAME                BEGIN LENGTH
---  ----   ----                ----- ------

 5.  E      SQD OPER NON-DH     11.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
□:
      10 3

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      6
          TOUR POSITION INDICATORS
          ---- -------- ----------
NO.  CODE   NAME                BEGIN LENGTH
---  ----   ----                ----- ------

 6.  E1     SQD OPER DH         12.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
□:
      11 3

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!
YES
```

TOUR POSITION INDICATORS

NO.	CODE	NAME	BEGIN	LENGTH
1.	A	1ST OPERATIONAL	2.00	3.00
2.	C	SUBS OPER SQD	5.00	2.50
3.	C1	SUBS OPER SHIP	8.00	2.00
4.	C2	SUBS OPER STAFF	8.00	2.00
5.	E	SQD OPER NON-DH	10.00	3.00
6.	E1	SQD OPER DH	11.00	3.00
7.	E2	SHP OPER SR.04	13.00	2.00
8.	G1	OPER CDR	16.00	2.00
9.	G2/3	SQD OPER XO/CO	16.00	2.50
10.	G4/5	S.C.I.G.	18.50	1.50
11.	G6	SHP OPER DH	18.50	2.00
12.	H1	OPER CAPT	22.00	2.00
13.	H2	MAJ SEA CMD	22.00	2.00
14.	H3	SEQ SEA CMD	24.00	2.00
15.	H4	POST MAJ CMD	24.00	2.00

DO YOU WANT TO MAKE THESE CHANGES PERMANENT? ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

□:
3

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROP&PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(29)	19	99	99	69	49	15	56	60	17	16	11	11	5	5
1982	(24)	21	97	97	91	70	14	55	57	20	16	17	17	6	6
1983	(8)	27	88	88	(10)	(11)	16	48	49	16	15	23	23	9	9
1984	(3)	22	(7)	(7)	100	(25)	33	42	44	15	14	25	25	14	14
1985	(1)	19	(19)	(19)	100	(22)	40	46	45	14	13	24	24	19	19
1986	99	17	(32)	(32)	(15)	(26)	40	72	63	11	11	24	24	20	20
1981-85	(13)	21	(2)	(2)	92	85	20	49	50	16	15	18	18	9	9
1982-86	(7)	21	(8)	(8)	(3)	(8)	23	51	51	15	14	22	22	11	11

CHANGE VIII

(PROP PILOTS)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      2

DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
NO

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      7
         TOUR POSITION INDICATORS

NO.  CODE   NAME               BEGIN  LENGTH

 7.  E2     SHP OPER SR.04     13.00   2.00

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
□:
      14 2

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!
YES
         TOUR POSITION INDICATORS

NO.  CODE   NAME               BEGIN  LENGTH

 1.  A      1ST OPERATIONAL     2.00   3.00
 2.  C      SUBS OPER SQD       5.00   2.50
 3.  C1     SUBS OPER SHIP      8.00   2.00
 4.  C2     SUBS OPER STAFF     8.00   2.00
 5.  E      SQD OPER NON-DH    11.00   2.50
 6.  E1     SQD OPER DH        12.00   2.50
 7.  E2     SHP OPER SR.04     14.00   2.00
 8.  G1     OPER CDR           16.00   2.00
 9.  G2/3   SQD OPER XO/CO     16.00   2.50
10.  G4/5   S.C.I.C.           18.50   1.50
11.  G6     SHP OPER DH        18.50   2.00
12.  H1     OPER CAPT          22.00   2.00
13.  H2     MAJ SEA CMD        22.00   2.00
14.  H3     SEQ SEA CMD        24.00   2.00
15.  H4     POST MAJ CMD       24.00   2.00

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!

NO
```

CHANGE VIII (CONT.)

```
NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
0:
     4

DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
YES
                   THE TOUR-GRADE MATCH MATRIX
                   --- ---------- ----- ------

NO.  CODE  TOURNAMES             ENS  LTJG   LT  LCDR   CDR  CAPT
---  ----  ---------             ---  ----   --  ----   ---  ----

 1.  A     1ST OPERATIONAL        1     1     1    0     0     0
 2.  C     SUBS OPER SQD          0     0     1    1     0     0
 3.  C1    SUBS OPER SHIP         0     0     1    1     0     0
 4.  C2    SUBS OPER STAFF        0     0     1    1     0     0
 5.  E     SQD OPER NON-DH        0     0     0    1     0     0
 6.  E1    SQD OPER DH            0     0     0    1     0     0
 7.  E2    SHP OPER SR.04         0     0     0    1     0     0
 8.  G1    OPER CDR               0     0     0    0     1     0
 9.  G2/3  SQD OPER XO/CO         0     0     0    0     1     0
10.  G4/5  S.C.I.G.               0     0     0    0     1     0
11.  G6    SHP OPER DH            0     0     0    0     1     0
12.  H1    OPER CAPT              0     0     0    0     0     1
13.  H2    MAJ SEA CMD            0     0     0    0     0     1
14.  H3    SEQ SEA CMD            0     0     0    0     0     1
15.  H4    POST MAJ CMD           0     0     0    0     0     1

TYPE NUMBER OF TOUR WHOSE ASSIGNMENT OF GRADES MAY HAVE TO BE CHANGED!
  TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.
0:
     7
                   CURRENT GRADE ASSIGNMENT
                   ------- ----- ----------

NO.  CODE     TOURNAME           ENS LTJG   LT LCDR  CDR CAPT
---  ----     --------           --- ----   -- ----  --- ----

 7.  E2       SHP OPER SR.04      0    0     0   1    0    0

DO YOU WANT TO CHANGE THE ABOVE ASSIGNMENT?   ANSWER YES OR N (NO)!
YES
TO GIVE NEW ASSIGNMENT TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES):
EACH NUMBER MUST BE 0 OR 1 !
0:
     0 0 0 1 1 0

TYPE NUMBER OF TOUR WHOSE ASSIGNMENT OF GRADES MAY HAVE TO BE CHANGED!
  TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.
0:
     0

DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!

YES
```

THE TOUR-GRADE MATCH MATRIX

NO.	CODE	TOURNAMES	ENS	LTJG	LT	LCDR	CDR	CAPT
1.	A	1ST OPERATIONAL	1	1	1	0	0	0
2.	C	SUBS OPER SQD	0	0	1	1	0	0
3.	C1	SUBS OPER SHIP	0	0	1	1	0	0
4.	C2	SUBS OPER STAFF	0	0	1	1	0	0
5.	E	SQD OPER NON-DH	0	0	0	1	0	0
6.	E1	SQD OPER DH	0	0	0	1	0	0
7.	E2	SHP OPER SR.04	0	0	0	1	1	0
8.	G1	OPER CDR	0	0	0	0	1	0
9.	G2/3	SQD OPER XO/CO	0	0	0	0	1	0
10.	G4/5	S.C.I.G.	0	0	0	0	1	0
11.	G6	SHP OPER DH	0	0	0	0	1	0
12.	H1	OPER CAPT	0	0	0	0	0	1
13.	H2	MAJ SEA CMD	0	0	0	0	0	1
14.	H3	SEQ SEA CMD	0	0	0	0	0	1
15.	H4	POST MAJ CMD	0	0	0	0	0	1

DO YOU WANT TO MAKE THESE CHANGES PERMANENT? ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

□:
3

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROP&PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(29)	19	99	99	64	59	14	56	60	17	16	11	11	5	5
1982	(24)	21	97	97	98	75	14	55	56	20	16	17	17	6	6
1983	(8)	27	88	88	(16)	(9)	16	48	49	16	15	23	23	9	9
1984	(3)	22	(7)	(7)	(30)	(36)	25	42	44	15	14	25	25	14	14
1985	(1)	19	(19)	(19)	(23)	(45)	57	46	45	14	13	24	24	19	19
1986	99	17	(32)	(32)	(20)	(44)	55	72	63	11	11	24	24	20	20
1981-85	(13)	21	(2)	(2)	(2)	98	19	48	50	16	15	18	18	9	9
1982-86	(7)	21	(8)	(8)	(17)	(20)	24	51	51	15	14	22	22	11	11

CHANGE IX

(JET PILOTS)

```
CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      2

DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
NO

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      9
            TOUR POSITION INDICATORS

NO.  CODE   NAME                 BEGIN LENGTH

 9.  G2/3   SQD OPER XO/CO       16.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
□:
      15 3

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!
YES
            TOUR POSITION INDICATORS

NO.  CODE   NAME                 BEGIN LENGTH

 1.  A      1ST OPERATIONAL       2.50   3.00
 2.  C      SUBS OPER SQD         5.50   2.50
 3.  C1     SUBS OPER SHIP        8.00   2.00
 4.  C2     SUBS OPER STAFF       8.00   2.00
 5.  E      SQD OPER NON-DH      11.00   2.50
 6.  E1     SQD OPER DH          12.00   2.50
 7.  E2     SHP OPER SR.04       13.00   2.00
 8.  G1     OPER CDR             16.00   2.00
 9.  G2/3   SQD OPER XO/CO       15.00   3.00
10.  G4/5   S.C.I.G.             18.50   1.50
11.  G6     SHP OPER DH          18.50   2.00
12.  H1     OPER CAPT            22.00   2.00
13.  H2     MAJ SEA CMD          22.00   2.00
14.  H3     SEQ SEA CMD          24.00   2.00
15.  H4     POST MAJ CMD         24.00   2.00

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!

YES
```

```
ARE YOU SURE YOU WANT TO ALTER THE PERMANENT FILE?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
      3

RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4
TYPE ONE OF THE NUMBERS LISTED ABOVE!

⎕:
      3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE JET&PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(18)	37	(2)	(2)	62	80	79	75	49	54	51	23	23	11	11
1982	(18)	34	(19)	(19)	(7)	(1)	86	66	46	63	51	29	29	15	15
1983	(9)	34	(19)	(19)	(33)	(32)	96	55	49	56	52	34	34	22	22
1984	(4)	44	(11)	(11)	(45)	(57)	(45)	63	56	52	49	31	31	29	29
1985	(3)	41	(9)	(9)	(53)	(68)	(66)	74	80	41	43	31	31	34	34
1986	(3)	34	(31)	(31)	(50)	(72)	(68)	96	(13)	45	43	32	32	31	31
1981-85	(10)	38	(12)	(12)	(15)	(27)	(13)	66	54	52	49	29	29	19	18
1982-86	(7)	37	(18)	(18)	(38)	(46)	(32)	68	61	50	47	31	31	24	24

APPENDIX O

MULTIPLE PARAMETER ALTERATIONS

CHANGE X

(PROP PILOTS)

```
      6 AIRTOURS 81

YOU MAY SELECT ONE OF THE FOLLOWING SUBCOMMUNITIES:

DONE          TYPE 0
PROP PILOTS   TYPE 1
PROP NFOS     TYPE 2
JET  PILOTS   TYPE 3
JET  NFOS     TYPE 4
HELO PILOTS   TYPE 5

⎕:
      1

THE FOLLOWING OPTIONS ARE AVAILABLE:

0. DONE WITH ALL WORK:    TYPE 0
1. DISPLAY SOME DATA:     TYPE 1
2. CHANGE SOME DATA:      TYPE 2
3. DISPLAY RESULTS:       TYPE 3

⎕:
      2

THE FOLLOWING CHANGES MAY BE MADE IN THE DATA:

0. DONE WITH ALL CHANGES:                                   TYPE 0
1. CHANGE NUMBERS OF ORGANIZATIONS BY TYPE:                 TYPE 1
2. CHANGE THE BEGINNING YEAR AND/OR LENGTH OF ANY TOUR:     TYPE 2
3. CHANGE NUMBER OF BILLETS BY ORGANIZATION TYPE:           TYPE 3
4. CHANGE THE GRADE ASSIGNMENT FOR SOME TOURS:              TYPE 4
5. CHANGE THE INVENTORY OF OFFICERS FOR SOME FISCAL YEAR:   TYPE 5
6. CHANGE NUMBERS OF ORGANIZATIONS BY FISCAL YEAR:          TYPE 6

⎕:
      1

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      9
                        CURRENT NUMBERS
                        ------- -------
NO.  ORGANIZATION        1981  1982  1983  1984  1985  1986
---  ------------        ----  ----  ----  ----  ----  ----
 9.  VC2                    1     1     1     1     1     1

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
⎕:
      0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      11
```

```
                         CURRENT NUMBERS
                         ------- -------
NO.  ORGANIZATION          1981  1982  1983  1984  1985  1986
---  ------------          ----  ----  ----  ----  ----  ----
11.  VC6                      1     1     1     1     1     1

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW NUMBERS TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES)!
□:
      0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATIONTYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      2

DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
YES
          TOUR POSITION INDICATORS
          ---- -------- ----------
NO.  CODE   NAME                 BEGIN  LENGTH
---  ----   ----                 -----  ------

 1.  A      1ST OPERATIONAL       2.00   3.00
 2.  C      SUBS OPER SQD         5.00   2.50
 3.  C1     SUBS OPER SHIP        8.00   2.00
 4.  C2     SUBS OPER STAFF       8.00   2.00
 5.  E      SQD OPER NON-DH      11.00   2.50
 6.  E1     SQD OPER DH          12.00   2.50
 7.  E2     SHP OPER SR.04       13.00   2.00
 8.  G1     OPER CDR             16.00   2.00
 9.  G2/3   SQD OPER XO/CO       16.00   2.50
10.  G4/5   S.C.I.G.             18.50   1.50
11.  G6     SHP OPER DH          18.50   2.00
12.  H1     OPER CAPT            22.00   2.00
13.  H2     MAJ SEA CMD          22.00   2.00
14.  H3     SEQ SEA CMD          24.00   2.00
15.  H4     POST MAJ CMD         24.00   2.00

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      1

          TOUR POSITION INDICATORS
          ---- -------- ----------
NO.  CODE   NAME                 BEGIN  LENGTH
---  ----   ----                 -----  ------

 1.  A      1ST OPERATIONAL       2.00   3.00

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
□:
      2 3.5
```

CHANGE X (CONT.)

```
TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      2
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                  BEGIN LENGTH
---  ----   ----                  ----- ------
 2.  C      SUBS OPER SQD          5.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
⎕:
      5.5 2.5

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      5
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                  BEGIN LENGTH
---  ----   ----                  ----- ------
 5.  E      SQD OPER NON-DH       11.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
⎕:
      10 3

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      6
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                  BEGIN LENGTH
---  ----   ----                  ----- ------
 6.  E1     SQD OPER DH           12.00   2.50

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
⎕:
      11 3

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
      7
         TOUR POSITION INDICATORS
         ---- -------- ----------
NO.  CODE   NAME                  BEGIN LENGTH
---  ----   ----                  ----- ------
 7.  E2     SHP OPER SR.04        13.00   2.00

DO YOU WANT TO CHANGE THE ABOVE?   ANSWER YES OR N (NO)!
YES
TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR
⎕:
      14 2

TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.
```

CHANGE X (CONT.)

```
DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!
YES
         TOUR POSITION INDICATORS
         ---- -------- ----------

NO.  CODE    NAME                  BEGIN  LENGTH
---  ----    ----                  -----  ------

 1.  A       1ST OPERATIONAL        2.00   3.50
 2.  C       SUBS OPER SQD          5.50   2.50
 3.  C1      SUBS OPER SHIP         8.00   2.00
 4.  C2      SUBS OPER STAFF        8.00   2.00
 5.  E       SQD OPER NON-DH       10.00   3.00
 6.  E1      SQD OPER DH           11.00   3.00
 7.  E2      SHP OPER SR.04        14.00   2.00
 8.  G1      OPER CDR              16.00   2.00
 9.  G2/3    SQD OPER XO/CO        16.00   2.50
10.  G4/5    S.C.I.C.              18.50   1.50
11.  G6      SHP OPER DH           18.50   2.00
12.  H1      OPER CAPT             22.00   2.00
13.  H2      MAJ SEA CMD           22.00   2.00
14.  H3      SEQ SEA CMD           24.00   2.00
15.  H4      POST MAJ CMD          24.00   2.00

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:

DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED?   ANSWER YES OR N (NO)!
NO

TYPE NUMBER OF TOUR WHOSE ASSIGNMENT OF GRADES MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.
⎕:
      7
                  CURRENT GRADE ASSIGNMENT
                  ------- ----- ----------

NO.  CODE      TOURNAME              ENS LTJG   LT LCDR  CDR CAPT
---  ----      --------              --- ----   -- ----  --- ----

 7.  E2        SHP OPER SR.04         0    0    0    1    0    0

DO YOU WANT TO CHANGE THE ABOVE ASSIGNMENT?   ANSWER YES OR N (NO)!
YES
TO GIVE NEW ASSIGNMENT TYPE 6 NUMBERS (SEPARATED BY BLANK SPACES):
EACH NUMBER MUST BE 0 OR 1 !
⎕:
      0 0 0 1 1 0

TYPE NUMBER OF TOUR WHOSE ASSIGNMENT OF GRADES MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.
⎕:
      0

DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED AGAIN?   ANSWER YES OR N (NO)!
NO

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
⎕:
```

CHANGE X (CONT.)

3
BILLET MATRIX OPTIONS: PROP&PILOT-1 /PROP-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
1

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1.	VP	30	1	0	0	2	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
27 1 0 0 2 1 0 0 1 0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
2

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
2.	VAW(E2B)	9	0	0	0	2	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
8 0 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
3

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
3.	VAW(E2C)	7	0	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
6 0 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
4

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
4.	VQ1	16	2	0	0	3	0	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
14 2 0 0 2 0 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
5.	VQ2	20	2	0	0	2	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
18 2 0 0 2 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
6

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
6.	VQ3	17	12	0	0	1	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
15 12 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
7

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
7.	VQ4	34	10	0	0	3	2	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
32 10 0 0 1 2 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
10

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
10.	VC3	6	0	0	0	1	3	0	0	2	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
4 0 0 0 1 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
12

CHANGE X (CONT.)

```
                                        CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION          A    C    C1   C2    E    E1   E2   G1  G2/3  G4/5   G6   H1   H2   H3   H4

12.  VC8                   8    0    0    0     1    3    0    0    2     0     0    0    0    0    0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      7 0 0 0 1 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      13
                                        CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION          A    C    C1   C2    E    E1   E2   G1  G2/3  G4/5   G6   H1   H2   H3   H4

13.  VR24                  25   0    0    0     8    8    0    2    2     0     0    0    0    0    0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      21 0 0 0 7 7 0 2 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      14
                                        CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION          A    C    C1   C2    E    E1   E2   G1  G2/3  G4/5   G6   H1   H2   H3   H4

14.  VRC30                 15   4    0    0     2    1    0    0    1     0     0    0    0    0    0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      14 4 0 0 1 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      15
                                        CURRENT NUMBERS OF BILLETS

NO.  ORGANIZATION          A    C    C1   C2    E    E1   E2   G1  G2/3  G4/5   G6   H1   H2   H3   H4

15.  VRC40                 17   4    0    0     1    2    0    0    2     0     0    0    0    0    0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      16 4 0 0 0 2 0 0 2 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      16
```

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
16.	VRC50	17	15	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
14 15 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
17

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
17.	VXE6	8	9	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
6 9 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
18

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
18.	VXN8	11	1	0	0	1	1	0	0	1	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
9 1 0 0 0 1 0 0 1 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX? ANSWER YES OR N (NO)!
YES
BILLET MATRIX OPTIONS: PROP&PILOT-1 /PROP-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
□:
1
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
25

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
25.	CV 1	0	0	4	0	0	0	1	1	0	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
0 0 0 0 0 0 1 1 0 0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
26

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
26.	CV 2	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
27

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
27.	CVN	0	0	4	0	0	0	1	2	0	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 0 0 0 0 1 2 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX? ANSWER YES OR N (NO)!
YES
BILLET MATRIX OPTIONS: PROP&PILOT-1 /PROP-2 /PILOT-3 /AVIATION-4 /APPORTIONED-5
⎕:
4
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
25

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
25.	CV 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA? ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
⎕:
0 0 4 0 0 0 0 0 0 0 0 0 0 0 0

TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

⎕:
26

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
26.	CV 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 4 0 0 0 0 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:

      27
```

CURRENT NUMBERS OF BILLETS

NO.	ORGANIZATION	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
27.	CVN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

```
DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA?   ANSWER YES OR N (NO)!
YES

TO GIVE NEW BILLETS TYPE 15 NUMBERS (SEPARATED BY BLANK SPACES)
□:
      0 0 4 0 0 0 0 0 0 0 0 0 0 0 0
TYPE NUMBER OF ORGANIZATION WHOSE BILLETS MAY HAVE TO BE CHANGED!
   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.

□:
      0

DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX?   ANSWER YES OR N (NO)!
NO

DO YOU WANT TO MAKE THESE CHANGES PERMANENT?   ANSWER YES OR N (NO)!
NO

NO ALTERATION HAS BEEN MADE IN THE FILE.

CHANGE OPTIONS:
DONE-0/ORGANIZATIONS-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5 /ORGANIZATIONS BY FY-6
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      0

OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3
TYPE ONE OF THE NUMBERS LISTED ABOVE!
□:
      3

THE FOLLOWING RESULTS MAY BE DISPLAYED BY TYPING THE APPROPRIATE NUMBER:
0. DONE WITH DISPLAYING RESULTS                           TYPE 0
1. BILLET REQUIREMENTS FOR EACH TOUR AND FISCAL YEAR      TYPE 1
2. SUPPLY OF ELIGIBLE OFFICERS FOR EACH TOUR AND FY       TYPE 2
3. SEATOUR OPPRTUNITY (SHORTFALL) FOR EACH TOUR AND FY    TYPE 3
4. BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS)    TYPE 4

□:    3
```

SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE PROP∆PILOT OFFICERS IN PERCENTAGE

YEAR	A	C	C1	C2	E	E1	E2	G1	G2/3	G4/5	G6	H1	H2	H3	H4
1981	(10)	27	69	69	50	23	9	55	58	17	16	11	11	5	5
1982	(4)	34	66	66	68	40	8	54	55	20	16	17	17	6	6
1983	91	37	59	59	82	68	9	47	48	16	15	23	23	9	9
1984	83	45	73	73	75	82	17	40	43	15	14	25	25	14	14
1985	80	38	83	83	75	77	30	45	44	14	13	24	24	19	19
1986	79	30	99	99	87	85	31	70	61	11	11	24	24	20	20
1981-85	93	35	69	69	68	50	12	47	49	16	15	18	18	9	9
1982-86	87	36	74	74	77	65	14	49	49	15	14	22	22	11	11

APPENDIX P

AIRTOURS COMPUTER PROGRAM

```
∇AIRTOURS[⎕]∇
∇ Y AIRTOURS FY;FNMS;SUP;FNAME;FNUM;SHP;P;TRN;TRC;B;TOURS;A;GRD;FYP;FYO;TRN;TRC;INV;K;YY;Z;ZZ;N;G;IND;FYAV;INDP;INDO;SHIP;SEA
  ⍝THIS FN IS THE MASTER FN THAT GUIDES THE MODEL THROUHG ITS MAIN TASKS.
  ⍝IT CONSISTS OF NUMEROUS SUBFUNCTIONS.
  TITLETEXT
  SF←5ρ0 ⋄ SUP←ALLFILEREAD
 SC:FNAME←SELSUBCOM FNMS ⋄ →0×⍳1=ρFNAME
  (FNUM←1300) FILEREAD FNAME ⋄ Y FYMATCH FY ⋄ →0×⍳0=ρFYAV
  SHP←(⍳0) ROWNAMES SHP ⋄ TRN←(⍳0) ROWNAMES TRN ⋄ TRC←(⍳0) ROWNAMES TRC
  SHIP←'ORGANIZATION' ⋄ SEA←'OPERATIONAL'
  COM←1↑FNMS∧.=FNAME←FNAME,(0⌈(1↓ρFNMS)-ρFNAME)ρ' ' ⋄ OPTIONS ⋄ →SC
∇
∇TITLETEXT[⎕]∇
∇ TITLETEXT
  LF ⋄ 'AVIATION WARFARE OFFICER MODEL' ⋄ LF
  →0 RESPOND 'DO YOU WISH TO SEE DETAILED INSTRUCTIONS'
  AIRINSTRUCTIONS
∇
∇AIRINSTRUCTIONS[⎕]∇
∇ AIRINSTRUCTIONS
  LF ⋄ 'THIS PROGRAM CALCULATES OPERATIONAL AND COMMAND TOUR OPPORTUNITIES OR SHORTFALLS'
  'FOR THE FOLLOWING FIVE(5) SUBCOMMUNITIES OF AVIATION WARFARE OFFICERS:' ⋄ LF
  '1.  PROP PILOTS'
  '2.  PROP NFOS'
  '3.  JET PILOTS'
  '4.  JET NFOS'
  '5.  HELO PILOTS'
  LF ⋄ 'THE PROGRAM OFFERS THE FOLLOWING OPTIONS:' ⋄ LF
  '1.  DISPLAY SOME DATA'
  '2.  CHANGE SOME DATA'
  '3.  DISPLAY RESULTS'
  LF ⋄ 'SIX TYPES OF DATA MAY BE DISPLAYED FOR EACH SUBCOMMUNITY:' ⋄ LF
  '1.  NUMEER OF ORGANIZATIONS BY TYPE AND FISCAL YEAR'
  '2.  TOUR STARTS AND LENGTHS IN YCS FOR EACH TOUR'
  '3.  NUMBER OF BILLETS BY ORGANIZATION TYPE AND TOUR'
  '4.  GRADE ASSIGNMENTS FOR EACH TOUR'
  '5.  INVENTORY OF OFFICERS BY YCS AND GRADE FOR A SINGLE FY'
  '6.  TOTAL INVENTORY OF OFFICERS BY YCS AND FISCAL YEAR'
  LF ⋄ 'YOU MAY EITHER TEMPORARILY OR PERMENANTLY ALTER THE DATA'
  'BY SELECTION OF THE FOLLOWING CHANGES:' ⋄ LF
  '1.  CHANGE NUMBERS OF ORGANIZATIONS BY TYPE'
  '2.  CHANGE THE BEGINNING YEAR AND/OR LENGTH OF ANY TOUR'
  '3.  CHANGE NUMBER OF BILLETS BY ORGANIZATION TYPE'
  '4.  CHANGE THE GRADE ASSIGNMENT FOR SOME TOURS'
  '5.  CHANGE THE INVENTORY OF OFFICERS FOR SOME FISCAL YEAR'
  '6.  CHANGE NUMBERS OF ORGANIZATIONS BY FISCAL YEAR'
  LF ⋄ 'FOUR TYPES OF RESULTS ARE AVAILABLE FOR DISPLAY:' ⋄ LF
  '1.  BILLET REQUIREMENTS FOR EACH TOUR AND FISCAL YEAR'
  '2.  SUPPLY OF ELIGIBLE OFFICERS FOR EACH TOUR AND FY'
  '3.  SEATOUR OPPORTUNITY (SHORTFALL) FOR EACH TOUR AND FY'
  '4.  BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS)'
  LF ⋄ 'NORMALLY THE VALUES OF THE OPERATIONAL (SEATOUR) OPPORTUNITY TABLE WILL SHOW'
  'THE CHANCE OF BEING ASSIGNED TO AN OPERATIONAL OR COMMAND TOUR FOR OFFICERS'
  'WITHIN THE SELECTED SUBCOMMUNITY WITH COINCIDENT TIME IN SERVICE AND GRADE.'
  'IF THE VALUE IN THE TABLE IS IN PARENTHESES THE TOUR IS UNDERMANNED'
  'AND THE VALUE IS THE PERCENTAGE BY WHICH THE TOUR IS SHORT.'
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      ∇ALLFILEREAD[⎕]∇
    ∇ SUP←ALLFILEREAD;NM
[1]   ⍝THIS FN READS IN THE FILES OF ALL THE AVIATION SUBCOMMUNITIES AND COMPUTES AN AVERAGE SUPPLY VECTOR FOR EACH.
[2]    FNMS← 5 10 ⍴'PROP∆PILOTPROP∆NFO  JET∆PILOT JET∆NFO   HELO∆PILOT' ◇ SUP←0⍴NM←1
[3]   FR:(FNUM←1300) FILEREAD FNMS[NM;] ◇ SUP←SUP,COMPSUP INV ◇ →FR×⍳(1↑⍴FNMS)≥NM←NM+1
[4]    SUP←((1↑⍴FNMS),Z)⍴SUP ◇ SUP←SUP,[1](1↓⍴SUP)⍴0
    ∇
      ∇FILEREAD[⎕]∇
    ∇ FNUM FILEREAD FNAME;INVENTORY
[1]   ⍝THIS FN TIES THE FILE 'FNAME' WITH THE NUMBER 'FNUM'. 'FNAME' MUST BE A CHARACTER VECTOR, 'FNUM' A SCALAR.
[2]   ⍝THEN IT READS THE FIRST 11 COMPONENTS OF THAT FILE.
[3]   ⍝SHP=SHIPTYPES REPRESENTED IN P.          FYP=FISCAL YEARS REPRESENTED IN P.          P=SHIPTYPE MATRIX
[4]   ⍝TRN=TOURNAMES IN TOURS.       TRC=TOURCODES IN TOURS.        TOURS=TOUR MATRIX.      B=BILLET STRUCTURE MATRIX
[5]   ⍝GRD=GRADES.       FYO=FISCAL YEARS USED IN INVENTORY.        INVENTORY=INVENTORY OF OFFICERS.      A=TOUR-GRADE MATCH MATRIX
[6]   ⍝DOCUMENTATION FOR THESE CAN BE FOUND IN COMP 12 OF THE FILE NAMED 'FNAME'.
[7]    LFUNTIE ⎕FNUMS ◇ FNAME ⎕FTIE FNUM ◇ SHP←⎕FREAD(FNUM,1) ◇ FYP←⎕FREAD(FNUM,2) ◇ P←⎕FREAD(FNUM,3)
[8]    TRN←⎕FREAD(FNUM,4) ◇ TRC←⎕FREAD(FNUM,5) ◇ TOURS←⎕FREAD(FNUM,6) ◇ B←⎕FREAD(FNUM,7)
[9]    GRD←⎕FREAD(FNUM,8) ◇ FYO←⎕FREAD(FNUM,9) ◇ INVENTORY←⎕FREAD(FNUM,10) ◇ A←⎕FREAD(FNUM,11)
[10]  ⍝THE FN ALSO ASSIGNS THE BASIC DIMENSIONAL VARIABLES AND RESHAPES THE INVENTORY:
[11]   K←1↑⍴P ◇ YY←⍴FYO ◇ Z←1↓⍴TOURS ◇ ZZ←1↓⍴B ◇ N←1↑⍴INVENTORY ◇ G←1↓⍴A ◇ INV←REPACK INVENTORY
    ∇
      ∇COMPSUP[⎕]∇
    ∇ S←COMPSUP INV;INVSUM;T
[1]   ⍝THIS FN COMPUTES THE AVERAGE SUPPLY OF OFFICERS FOR EACH TOUR OVER ALL FY'S FOR WHICH INVENTORY IS AVAILABLE.
[2]   ⍝NOTE THAT DOUBLE COUNTING OF OFFICERS MAY OCCUR IF MORE THAN ONE TOUR EXIST AT THE SAME CAREER LEVEL.
[3]   ⍝THIS FN IS TO BE USED FOR APPORTIONING NON-DISCRETE AVIATION BILLETS AMONG THE VARIOUS AVIATION SUBCOMMUNITIES.
[4]    INVSUM←(+⌿INV)÷⍴FYO ◇ T←(1↓⍴INVSUM) COMPTPIC TOURS ◇ S←+/A×(⍉T)+.×INVSUM
    ∇
      ∇REPACK[⎕]∇
    ∇ INV←REPACK INVENTORY
[1]   ⍝THIS FN RESHAPES THE OFFICER INVENTORY MATRIX OBTAINED FROM THE FILE 'SURFACE' INTO AN ARRAY OF SIZE (YY,N,G).
[2]   ⍝WHERE YY IS THE NUMBER OF FISCAL YEARS FOR WHICH OFFICER INVENTORIES ARE AVAILABLE IN THE FILE.
[3]    INV←⍉INVENTORY ◇ INV←(G,YY,N)⍴INV ◇ INV← 2 1 3 ⍉INV ◇ INV←⌽ 1 3 2 ⍉INV
    ∇
      ∇COMPTPIC[⎕]∇
    ∇ T←N COMPTPIC BL;BD;U;L
[1]   ⍝THIS FN COMPUTES THE TPIC MATRIX FROM THE MATRIX OF BEGINNING YEARS AND TOURLENGTHS.
[2]    BD←BL[1;],[1.5]+⌿BL
[3]    U←BD[;2]∘.-¯1+⍳N ◇ U←1⌊U×U>0 ◇ L←(-BD[;1])∘.+⍳N ◇ L←1⌊L×L>0 ◇ →0,⍴T←⍉U⌊L
    ∇
      ∇SELSUBCOM[⎕]∇
    ∇ CNAME←SELSUBCOM CMNTS
[1]   ⍝THIS FN FACILITATES THE SELECTION OF ONE OF SEVERAL SUBCOMMUNITIES.
[2]    →SHORT×⍳SF[5]>0 ◇ LF ◇ 'YOU MAY SELECT ONE OF THE FOLLOWING SUBCOMMUNITIES:' ◇ LF
[3]    'DONE          TYPE 0'
[4]    'PROP PILOTS   TYPE 1'
[5]    'PROP NFOS     TYPE 2'
[6]    'JET  PILOTS   TYPE 3'
[7]    'JET  NFOS     TYPE 4'
[8]    'HELO PILOTS   TYPE 5'
[9]    LF ◇ SF[5]←SF[5]+1 ◇ →SEL
[10]  SHORT:'SUBCOMMUNITY OPTIONS:' ◇ 'DONE-0/PROP PILOTS-1/PROP NFOS-2/JET PILOTS-3/JET NFOS-4/HELO PILOTS-5'
[11]   'TYPE ONE OF THE NUMBERS LISTED ABOVE!'
[12]  SEL:→ERR×⍳0=(0,⍳5) CHECK CNAME←1↑,⎕ ◇ →0×⍳CNAME=0 ◇ CNAME←,CMNTS[CNAME;] ◇ →0
[13]  ERR:→SEL ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
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      ∇FYMATCH[⎕]∇
    ∇ Y FYMATCH FY;FYS;YMP;YMO;YM
[1]   ⍝THIS FN MATCHES THE FISCAL YEARS REQUESTED TO THOSE FOR WHICH SHIP AND INVENTORY DATA ARE AVAILABLE IN THE FILE.
[2]   ⍝IT ALSO TAKES NOTE WHICH YEARS WILL BE NEEDED FROM THE SHIP MATRIX AND INVENTORY MATRIX.
[3]    FYS←¯1+(⍳Y+1↑,Y)+FY+1900×100≥FY←1↑,FY
[4]    YMP←+/FYS∘.=FYP ◇ YMO←+/FYS∘.=FYO ◇ YM←YMP×YMO ◇ IND←(IND>0)/IND←YM×⍳⍴YM ◇ FYAV←FYS[IND]
[5]    INDP←(INDP>0)/INDP←,((⍴INDP)⍴⍳(⍴INDP)[2])×INDP←FYAV∘.=FYP ◇ INDO←(INDO>0)/INDO←,((⍴INDO)⍴⍳(⍴INDO)[2])×INDO←FYAV∘.=FYO
[6]    →NONE×⍳0=⍴FYAV ◇ →0×⍳(⍴FYS)=⍴FYAV
[7]    'ONLY THE FOLLOWING YEARS ARE SUPPORTED BY THE DATA IN THE FILE: ',⍕FYAV ◇ →0
[8]   NONE:'NONE OF THE YEARS REQUESTED ARE SUPPORTED BY THE DATA IN THE FILE.'
    ∇
      ∇OPTIONS[⎕]∇
    ∇ OPTIONS;CT;BT;TRCM;FSTR;TITLE;HEAD;TABLE;BM
[1]   ⍝THIS FN CONTAINS THE MAIN SUBFUNCTIONS THAT ENABLE THE MODEL TO DISPLAY DATA, CHANGE DATA AND COMPUTE RESULTS.
[2]   RECOMP:BM←B ◇ →ST×⍳PNUM≠1300 ◇ SUP[COM;]←COMPSUP INV ◇ BM←FNAME BILLCOMP SUP
[3]   ST:OPTIONSTEXT ◇ →(O1,O2,O3,ERR) ROUTING ⎕
[4]   O1:DISPDATA ◇ →ST
[5]   O2:CHANGEDATA ◇ →RECOMP
[6]   O3:RESULTS ◇ →ST
[7]   ERR:→ST ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
    ∇
      ∇BILLCOMP[⎕]∇
    ∇ BM←FNAME BILLCOMP SUP;MIX;J
[1]   ⍝THIS FN COMPUTES THE SUM OF DISCRETE AND (A PORTION OF) NON-DISCRETE BILLETS.
[2]   ⍝THE APPROPRIATE PORTION IS COMPUTED BASED ON THE SUPPLY OF OFFICERS IN ALL AVIATION SUBCOMMUNITIES.
[3]    MIX←FNAME COMPMIX SUP
[4]    BM←B[;⍳Z] ◇ J←1
[5]   LOOP:BM←BM+B[;(J×Z)+⍳Z]×(K,Z)⍴MIX[J;] ◇ →LOOP×⍳(1↑⍴MIX)≥J←J+1
    ∇
      ∇COMPMIX[⎕]∇
    ∇ MIX←FNAME COMPMIX SUP;CM;DEN1;DEN2;DEN3;DEN;NUM
[1]   ⍝THIS FN COMPUTES THE PROPORTIONS WITH WHICH THE NON-DISCRETE BILLETS SHOULD BE ADDED TO THE DISCRETE ONES GIVEN
[2]   ⍝THE SUBCOMMUNITY SELECTED. THE COMPUTATION IS BASED ON THE AVAILABLE SUPPLY OF OFFICERS IN THE RESP. SUBCOMMUNITIES.
[3]    DEN1←+⌿SUP[COM,(1+COM)-2×2|1+COM;] ◇ SUP←SUP,[1] SUP ◇ DEN2←+⌿SUP[COM,(2+COM),(4+COM);] ◇ SUP←((1+1↑⍴FNMS),Z)↑SUP
[4]    DEN3←+⌿SUP ◇ DEN←DEN1,[1] DEN2,[0.5] DEN3 ◇ NUM←(3,Z)⍴SUP[COM;] ◇ MIX←NUM÷DEN
    ∇
      ∇OPTIONSTEXT[⎕]∇
    ∇ OPTIONSTEXT
[1]   ⍝THIS FN GIVES A LISTING OF THE OPTIONS AVAILABLE TO THE USER.
[2]   ⍝IT ALSO HAS A SHORT VERSION OF THIS LISTING WHICH IS USED AFTER THE INITIAL OCCASION.
[3]    →SHORT×⍳SF[3]≥1
[4]    LF ◇ 'THE FOLLOWING OPTIONS ARE AVAILABLE:' ◇ LF
[5]    '0. DONE WITH ALL WORK:    TYPE 0'
[6]    '1. DISPLAY SOME DATA:     TYPE 1'
[7]    '2. CHANGE SOME DATA:      TYPE 2'
[8]    '3. DISPLAY RESULTS:       TYPE 3'
[9]    LF ◇ SF[3]←SF[3]+1 ◇ →0
[10]  SHORT:LF ◇ 'OPTIONS: DONE-0 /DATA-1 /CHANGE-2 /RESULT-3' ◇ 'TYPE ONE OF THE NUMBERS LISTED ABOVE!'
    ∇
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    ∇DISPDATA[⎕]∇
  ∇ DISPDATA
[1]  ⍝THIS FN CONTAINS ALL THE SUBFUNCTIONS THAT DISPLAY VARIOUS PARTS OF THE DATA.
[2]  ST:DISPTEXT ◇ →(D1,D2,D3,D4,D5,D6,ERR) ROUTING ⎕
[3]  D1:SHIPLIST P[;INDP] ◇ →ST
[4]  D2:TOURLIST TOURS ◇ →ST
[5]  D3:BILLETLIST B ◇ →ST
[6]  D4:TGMATCHLIST A ◇ →ST
[7]  D5:INVLIST INV[INDO;;] ◇ →ST
[8]  D6:TOTINVLIST INV[INDO;;] ◇ →ST
[9]  ERR:→ST ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
    ∇DISPTEXT[⎕]∇
  ∇ DISPTEXT;L
[1]  ⍝THIS FN GIVES A LISTING OF THE VARIOUS DATA DISPLAY OPTIONS AVAILABLE TO THE USER.
[2]  ⍝IT ALSO HAS A SHORT VERSION OF THIS LISTING WHICH IS USED AFTER THE INITIAL OCCASION.
[3]   →SHORT×⍳SF[1]≥1
[4]   LF ◇ 'THE FOLLOWING ITEMS MAY BE DISPLAYED BY TYPING THE APPROPRIATE NUMBER:' ◇ LF
[5]   '0. DONE WITH DISPLAYING DATA:                                TYPE 0'
[6]   L,((60-⍴L←'1. NUMBER OF ',SHIP,'S BY TYPE AND FISCAL YEAR:')⍴' '),'TYPE 1'
[7]   '2. TOUR STARTS AND LENGTHS IN YCS FOR EACH TOUR:             TYPE 2'
[8]   L,((60-⍴L←'3. NUMBER OF BILLETS BY ',SHIP,' TYPE AND TOUR:')⍴' '),'TYPE 3'
[9]   '4. GRADE ASSIGNMENTS FOR EACH TOUR:                          TYPE 4'
[10]  '5. INVENTORY OF OFFICERS BY YCS AND GRADE FOR A SINGLE FY:   TYPE 5'
[11]  '6. TOTAL INVENTORY OF OFFICERS BY YCS AND FISCAL YEAR:       TYPE 6'
[12]  LF ◇ SF[1]←SF[1]+1 ◇ →0
[13] SHORT:LF ◇ 'DISPLAY OPTIONS:' ◇ 'DONE-0/',SHIP,'S-1/TOURS-2/BILLETS-3/GRADES-4/INVTRY-5/TOTAL INV-6'
[14]  'TYPE ONE OF THE NUMBERS LISTED ABOVE!'
  ∇
    ∇SHIPLIST[⎕]∇
  ∇ SHIPLIST P;FSTR;TITLE;HEAD;TABLE
[1]  ⍝THIS FN LISTS THE NUMBER OF SHIPS PROJECTED FOR THE FY'S SELECTED FOR EACH SHIP TYPE.
[2]   FSTR←'F3.0,X2,',(⍕1↓⍴SHP),'A1,X2,',(⍕⍴FYAV),'I5'
[3]   TITLE←FSTR CENTERANDLINE 'NUMBER OF ',SHIP,'S FORECAST'
[4]   HEAD←FSTR COLNAMESANDLINE ',NO.,',SHIP,(',' CODIFY FYAV)
[5]   TABLE←FSTR ⎕FMT((⍳1↑⍴P);SHP;P)
[6]   TITLE;HEAD;TABLE
  ∇
    ∇TOURLIST[⎕]∇
  ∇ LIST←TOURLIST T;FSTR;TITLE;HEAD;TABLE;I
[1]  ⍝THIS FN LISTS THE BEGIN YEAR AND LENGTH OF EACH SEA TOUR.
[2]   FSTR←'1F3.0,X2,',(⍕1↓⍴TRC),'A1,X3,',(⍕1↓⍴TRN),'A1,X2,',(⍕1↑⍴T),'F7.2'
[3]   TITLE←FSTR CENTERANDLINE 'TOUR POSITION INDICATORS' ◇ HEAD←FSTR COLNAMESANDLINE ',NO.,CODE,NAME,BEGIN,LENGTH'
[4]   TABLE←FSTR ⎕FMT((⍳Z);TRC;TRN;(⍉T)) ◇ LIST←TITLE,[1] HEAD,[1] TABLE
  ∇
    ∇BILLETLIST[⎕]∇
  ∇ BILLETLIST B;Z;SB;FSTR;HEAD;PI;TITLE;TABLE
[1]  ⍝THIS FN DISPLAYS THE BILLET STRUCTURE.
[2]   Z←(1↓⍴TOURS)⌊1↓⍴B
[3]  SEL:BT←(⍳5) BILLMATRSEL FNAME ◇ →0×⍳BT<0
[4]   FSTR←'1F3.0,X2,',(⍕(⍴SHIP)⌈1↓⍴SHP),'A1,X2,',(⍕Z),'BI5'
[5]   TITLE←FSTR CENTERANDLINE 'NUMBER OF ',CT,' ',SEA,' BILLETS BY ',SHIP,'TYPE'
[6]   HEAD←FSTR COLNAMESANDLINE ',NO.,',SHIP,TRCM
[7]   →MB×⍳BT≥ZZ ◇ PI←(SB>0)/SB←(⍳1↑⍴B)×0<+/B[;BT+⍳Z]
[8]   TABLE←FSTR ⎕FMT((⍳K)[PI];SHP[PI;];B[PI;BT+⍳Z]) ◇ →DISP
[9]  MB:TABLE←FSTR ⎕FMT(⍳K;SHP;BM)
[10] DISP:TITLE;HEAD;TABLE ◇ →0×⍳FNUM≠1300
[11]  →0 RESPOND 'DO YOU WANT ANY OTHER BILLET MATRIX DISPLAYED' ◇ →SEL
  ∇
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      ∇TGMATCHLIST[⎕]∇
    ∇ TGMATCHLIST A;FSTR;TITLE;HEAD;TABLE
[1]   ⍝THIS FN DISPLAYS WHAT GRADE OF OFFICERS ARE APPROPRIATE FOR EACH SEA TOUR.
[2]    FSTR←'1F3.0,X2,',(⍕1↓⍴TRC),'A1,X2,',(⍕1↓⍴TRN),'A1,X2,',(⍕G),'I',⍕2+1↓⍴(⍳0) ROWNAMES GRD
[3]    TITLE←FSTR CENTERANDLINE 'THE TOUR-GRADE MATCH MATRIX'
[4]    HEAD←FSTR COLNAMESANDLINE ',NO.,CODE,TOURNAMES',GRD
[5]    TABLE←FSTR ⎕FMT((⍳Z);TRC;TRN;A) ◇ TITLE;HEAD;TABLE

      ∇INVLIST[⎕]∇
    ∇ INVLIST INV;FY;FI;FSTR;HEAD;TITLE;TABLE
[1]   ⍝THIS FN DISPLAYS THE NUMBER OF OFFICERS PROJECTED FOR FISCAL YEAR FY, BY YCS AND GRADE.
[2]   ST:LP ◇ 'TYPE YEAR FOR WHICH YOU WANT INVENTORY OF OFFICERS DISPLAYED'
[3]    →ERR×⍳0=+/FI←FYAV=FY←FY+1900×100≥FY←(,⎕)[1]
[4]    FSTR←'X3,F3.0,X2,',(⍕G),'BI',(⍕2+1↓⍴(⍳0) ROWNAMES GRD),',X3'
[5]    TITLE←FSTR CENTERANDLINE 'INVENTORY OF ',FNAME,' OFFICERS FOR ',⍕FY
[6]    HEAD←FSTR COLNAMESANDLINE ',YCS',GRD
[7]    TABLE←FSTR ⎕FMT(⍳N;INV[+/IND×FI;;]) ◇ LP;TITLE;HEAD;TABLE;LP ◇ →0×⍳1=⍴FYAV
[8]    →0 RESPOND 'DO YOU WANT INVENTORY OF OFFICERS DISPLAYED FOR ANOTHER YEAR' ◇ →ST
[9]   ERR:→ST ERRMESSAGE 'YEAR REQUESTED IS NOT AVAILABLE.  AVAILABLE YEARS ARE:  ',⍕FYAV
    ∇
      ∇TOTINVLIST[⎕]∇
    ∇ TOTINVLIST INV;FSTR;TITLE;HEAD;TABLE
[1]   ⍝THIS FN DISPLAYS THE TOTAL NUMBER OF OFFICERS PROJECTED FOR ALL FISCAL YEARS, BY YCS.
[2]    FSTR←'F3.0,X2,',(⍕⍴FYAV),'I6,X15'
[3]    TITLE←FSTR CENTERANDLINE 'TOTAL INVENTORY OF ',FNAME,' OFFICERS'
[4]    HEAD←FSTR COLNAMESANDLINE(',YCS'),(',' CODIFY FYAV)
[5]    TABLE←FSTR ⎕FMT(⍳N;⍉+/INV) ◇ TITLE;HEAD;TABLE
    ∇
      ∇CHANGEDATA[⎕]∇
    ∇ CHANGEDATA;ZERO
[1]   ⍝THIS FN OFFERS THE USER A CHOICE OF SEVERAL CHANGES THAT MAY BE MADE IN THE DATA.
[2]   ST:CHANGETEXT ◇ ZERO←'   TYPING 0 MEANS NO MORE CHANGES ARE NEEDED.'
[3]    →(C1,C2,C3,C4,C5,C6,ERR) ROUTING ⎕
[4]   C1:SHIPCHNG ◇ →ST
[5]   C2:TOURCHNG ◇ →ST
[6]   C3:BILLCHNG ◇ →ST
[7]   C4:TGMATCHNG ◇ →ST
[8]   C5:INVCHNG ◇ →ST
[9]   C6:SHIPYCHNG ◇ →ST
[10]  ERR:→ST ERRMESSAGE 'INPUT ERROR, TRY AGAIN!'
    ∇
      ∇SHIPCHNG[⎕]∇
    ∇ SHIPCHNG;L;WL;FSTR;TITLE;HEAD;TABLE;NP
[1]   ⍝THIS FN ENABLES THE USER TO MAKE CHANGES IN THE NUMBER OF SHIPS FOR EACH SHIPTYPE.
[2]   ⍝THE CHANGE MAY BE ENTERED IN THE FILE AT THE USER'S CHOICE.
[3]   START:LP ◇ 'TYPE NUMBER OF ',SHIP,'TYPE FOR WHICH THE NUMBERS MAY HAVE TO BE CHANGED!' ◇ ZERO
[4]    LP ◇ →ERR×⍳0=WL←(0,⍳K) CHECK L←1↑,⎕ ◇ →PERM×⍳L=0
[5]    FSTR←'1F3.0,X2,',(⍕(⍴SHIP)[1↓⍴SHP),'A1,X2,',(⍕⍴FYAV),'I6'
[6]    TITLE←FSTR CENTERANDLINE 'CURRENT NUMBERS' ◇ HEAD←FSTR COLNAMESANDLINE ',NO.,',SHIP,(',' CODIFY FYAV)
[7]    TABLE←FSTR ⎕FMT(L;SHP[L;];P[L;INDP]) ◇ TITLE;HEAD;TABLE
[8]    →START RESPOND 'DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA'
[9]   INPUT:LP ◇ 'TO GIVE NEW NUMBERS TYPE ',(⍕⍴FYAV),' NUMBERS (SEPARATED BY BLANK SPACES)!'
[10]   →ERR×⍳(1↓⍴P[;INDP])≠⍴NP←,⎕ ◇ →ERR×⍳∨/0=((0,⍳100+⌈/+/P) CHECK NP) ◇ P[L;INDP]←NP ◇ →START
[11]  PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE THESE CHANGES PERMANENT'
[12]   →EXIT RESPOND 'ARE YOU REALLY SURE YOU WANT TO ALTER THE PERMANENT FILE'
[13]   P ⎕FREPLACE FNUM,3 ◇ LP ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[14]  ERR:→((START×0=WL)+INPUT×0≠WL) ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
[15]  EXIT:LP ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'
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      ∇TOURCHNG[⎕]∇
    ∇ TOURCHNG;L;WL;FSTR;TITLE;HEAD;TABLE;NT
[1]   ⍝THIS FN ENABLES THE USER TO MAKE CHANGES IN THE BEGINNING YEAR AND LENGTH OF EACH TOUR.
[2]   ⍝THE CHANGES MAY BE ENTERED IN THE FILE AT THE USER'S CHOICE.
[3]    →SEL RESPOND 'DO YOU WISH TO HAVE THE TOUR MATRIX DISPLAYED' ◇ TOURLIST TOURS
[4]   SEL:LF ◇ 'TYPE NUMBER OF TOUR WHOSE BEGIN YEAR AND LENGTH MAY HAVE TO BE CHANGED!' ◇ ZERO ◇ LF
[5]    →ERR×⍳0=WL←(0,⍳Z) CHECK L←1↑,⎕ ◇ →LAST×⍳L=0
[6]    (TOURLIST TOURS)[(⍳4),4+L;] ◇ →SEL RESPOND 'DO YOU WANT TO CHANGE THE ABOVE'
[7]   INPUT:'TYPE TWO NUMBERS (SEPARATED BY BLANK SPACE) FOR BEGIN YEAR AND LENGTH OF ABOVE TOUR'
[8]    →ERR×⍳2≠⍴NT←,⎕ ◇ →ERR×⍳(∨/0>NT)∨(30<+/NT) ◇ TOURS[;L]←NT ◇ →SEL
[9]   LAST:→PERM RESPOND 'DO YOU WANT THE TOUR MATRIX DISPLAYED AGAIN' ◇ TOURLIST TOURS
[10]  PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE THESE CHANGES PERMANENT'
[11]   →EXIT RESPOND 'ARE YOU SURE YOU WANT TO ALTER THR PERMANENT FILE'
[12]   TOURS ⎕FREPLACE FNUM,6 ◇ LF ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[13]  ERR:→((SEL×0=WL)+INPUT×0≠WL) ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
[14]  EXIT:LF ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'
    ∇
      ∇BILLCHNG[⎕]∇
    ∇ BILLCHNG;Z;BT;WL;FSTR;TITLE;HEAD;TABLE;NB
[1]   ⍝THIS FN ENABLES THE USER TO MAKE CHANGES IN THE NUMBER OF BILLETS FOR EACH SHIPTYPE.
[2]   ⍝THE CHANGE MAY BE ENTERED IN THE FILE AT THE USER'S CHOICE.
[3]    Z←(1↓⍴TOURS)⌊1↓⍴B
[4]   SEL:BT←(⍳4) BILLMATRSEL FNAME ◇ →0×⍳BT<0
[5]   START:LF;'TYPE NUMBER OF ',SHIP,' WHOSE BILLETS MAY HAVE TO BE CHANGED!' ◇ ZERO ◇ LF
[6]    →ERR×⍳0=WL←(0,⍳K) CHECK L←1↑,⎕ ◇ →DONE×⍳L=0
[7]    FSTR←'1F3.0,X2,',(⍕(⍴SHIP)⌈1↓⍴SHP),'A1,X2,',(⍕Z),'I5'
[8]    TITLE←FSTR CENTERANDLINE 'CURRENT NUMBERS OF BILLETS'
[9]    HEAD←FSTR COLNAMESANDLINE ',NO.,',SHIP,TRCN
[10]   TABLE←FSTR ⎕FMT(L;SHP[L;];B[L;BT+⍳Z]) ◇ TITLE;HEAD;TABLE
[11]   →START RESPOND 'DO YOU WANT TO MAKE ANY CHANGES IN THE ABOVE DATA'
[12]  INPUT:LF ◇ 'TO GIVE NEW BILLETS TYPE ',(⍕Z),' NUMBERS (SEPARATED BY BLANK SPACES)'
[13]   →ERR×⍳Z≠⍴NB←,⎕ ◇ →ERR×⍳∨/0=(0,⍳100+⌈+/+/B) CHECK NB
[14]   B[L;BT+⍳Z]←NB ◇ →START
[15]  DONE:→PERM×⍳FNUM≠1300 ◇ →PERM RESPOND 'DO YOU WANT TO MAKE CHANGES IN ANY OTHER BILLET MATRIX' ◇ →SEL
[16]  PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE THESE CHANGES PERMANENT'
[17]   →EXIT RESPOND 'ARE YOU REALLY SURE YOU WANT TO ALTER THE PERMANENT FILE'
[18]   ((K,ZZ)↑B) ⎕FREPLACE FNUM,7 ◇ LF ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[19]  ERR:→((START×0=WL)+INPUT×0≠WL) ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
[20]  EXIT:LF ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'
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      ∇TGMATCHNG[⎕]∇
    ∇ TGMATCHNG;L;ωL;FSTR;TITLE;HEAD;TABLE;NA
[1]   ⍝THIS FN ENABLES THE USER TO MAKE CHANGES IN THE ASSIGNMENT OF GRADES TO EACH TOUR.
[2]   ⍝THE CHANGES MAY BE ENTERED IN THE FILE AT THE USER'S CHOICE.
[3]    →SEL RESPOND 'DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED' ◇ TGMATCHLIST A
[4]   SEL:LF ◇ 'TYPE NUMBER OF TOUR WHOSE ASSIGNMENT OF GRADES MAY HAVE TO BE CHANGED!' ◇ ZERO
[5]    →ERR×⍳0=WL←(0,⍳Z) CHECK L←1↑,⎕ ◇ →LAST×⍳L=0
[6]    FSTR←'1F3.0,X2,',(⍕1↑⍴TRC),'A1,X5,',(⍕1↑⍴TRN),'A1,X2,',(⍕1↓⍴A),'I5'
[7]    TITLE←FSTR CENTERANDLINE 'CURRENT GRADE ASSIGNMENT'
[8]    HEAD←FSTR COLNAMESANDLINE ',NO.,CODE,TOURNAME',GRD
[9]    TABLE←FSTR ⎕FMT(L;TRC[L;];TRN[L;];A[L;]) ◇ TITLE;HEAD;TABLE
[10]   →SEL RESPOND 'DO YOU WANT TO CHANGE THE ABOVE ASSIGNMENT'
[11]  INPUT:'TO GIVE NEW ASSIGNMENT TYPE ';1↓⍴A;' NUMBERS (SEPARATED BY BLANK SPACES);' ◇ 'EACH NUMBER MUST BE 0 OR 1 !'
[12]   →ERR×⍳(1↓⍴A)≠⍴NA←,⎕ ◇ →ERR×⍳∨/0=(0 1) CHECK NA
[13]   A[L;]←NA ◇ →SEL
[14]  LAST:→PERM RESPOND 'DO YOU WANT THE TOUR-GRADE MATCH MATRIX DISPLAYED AGAIN' ◇ TGMATCHLIST A
[15]  PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE THESE CHANGES PERMANENT'
[16]   →EXIT RESPOND 'ARE YOU SURE YOU WANT TO ALTER THE PERMANENT FILE'
[17]   A ⎕FREPLACE FNUM,11 ◇ LF ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[18]  ERR:→((SEL×0=WL)+INPUT×0≠WL) ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
[19]  EXIT:LF ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'
    ∇
      ∇INVCHNG[⎕]∇
    ∇ INVCHNG;FY;FI;FSTR;HEAD;TITLE;TABLE;PINV;GRD;GG;NEWINV;PINVG;INI;NI
[1]   ⍝THIS FN ENABLES THE USER TO CHANGE THE INVENTORY OF OFFICERS FOR FISCAL YEAR FY, BY YCS AND GRADE.
[2]   ST:LF ◇ 'TYPE YEAR FOR WHICH INVENTORY OF OFFICERS MAY HAVE TO BE CHANGED.'
[3]    FY←FY+1900×100≥FY←(,⍞)[1] ◇ →ERR1×⍳0=+/FI←FY=FYAV
[4]    →CH RESPOND 'DO YOU WANT THE INVENTORY MATRIX DISPLAYED'
[5]    FSTR←'F3.0,',(⍕G),'BI8'
[6]    TITLE←FSTR CENTERANDLINE 'INVENTORY OF OFFICERS FOR ',⍕FY
[7]    HEAD←FSTR COLNAMESANDLINE ',YCS',GRD
[8]    TABLE←FSTR ⎕FMT(⍳N;INV[+/INDO×FI;;]) ◇ LF;TITLE;HEAD;TABLE;LF
[9]   CH:→NEXT RESPOND 'DO YOU WANT TO CHANGE THE ABOVE INVENTORY MATRIX'
[10]   'YOU WILL BE ASKED TO GIVE INPUTS BY GRADES' ◇ 'BUT ONLY FOR YEARS OF SERVICE (YCS) FOR WHICH THE NUMBERS ARE NOT ZERO.'
[11]   PINV←(⍉(⌽⍴PINV)⍴⍳N)×PINV←0<+⌿INV ◇ GRD←(⍳0) ROWNAMES GRD ◇ NEWINV←(N,0)⍴GG←1
[12]  LOOP:LF ◇ 'TYPE THE NUMBERS OF OFFICERS FOR THE FOLLOWING GRADE AND YCS;'
[13]   'GRADE: ',GRD[GG;],'                        YCS: ',⍕PINVG←(PINVG>0)/PINVG←PINV[;GG]
[14]   'PRESS ''RETURN'' TO HAVE ALL ENTRIES UNCHANGED FOR THIS GRADE.'
[15]   →CAT×⍳0=⍴INI←⍞FI,⎕ ◇ →ERR2×⍳(⍴PINVG)≠⍴INI ◇ →ERR2×⍳∨/0=((0,⍳+/INV[+/INDO×FI;;GG]) CHECK INI)
[16]  CAT:NI←((N-⍴NI)⍴0),NI←INI,(N-¯1↑PINVG)⍴0 ◇ NI←(NI×0<⍴INI)+INV[+/INDO×FI;;GG]×0=⍴INI ◇ NEWINV←NEWINV,NI
[17]   →LOOP×⍳G≥GG←GG+1 ◇ INV[+/INDO×FI;;]←NEWINV
[18]  NEXT:→PERM RESPOND 'DO YOU WANT INVENTORY OF OFFICERS DISPLAYED OR CHANGED FOR ANOTHER YEAR' ◇ →ST
[19]  PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE THESE CHANGES PERMANENT'
[20]   →EXIT RESPOND 'ARE YOU REALLY SURE YOU WANT TO ALTER THE PERMANENT FILE'
[21]   INVENTORY←UNPACK INV ◇ INVENTORY ⎕FREPLACE FNUM,10 ◇ LF ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[22]  ERR1:→ST ERRMESSAGE 'YEAR REQUESTED IS NOT AVAILABLE.  AVAILABLE YEARS ARE:  ',⍕FYAV
[23]  ERR2:→LOOP ERRMESSAGE 'WRONG INPUT. MUST SPECIFY ',(⍕⍴PINVG),' NUMBERS (INTEGERS), NAMELY:'
[24]  EXIT:LF ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'
    ∇
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      ∇SHIPYCHNG[⎕]∇
    ∇ SHIPYCHNG;FY;IP;J;SHP;SPC;PP;FSTR;TITLE;HEAD;TABLE;OP;NP;NEWP
[1]  ⍝THIS FN ENABLES THE USER TO MAKE CHANGES IN THE NUMBER OF ORGANIZATIONS (SHIPS) BY FISCAL YEAR.
[2]  START:LF ◇ 'TYPE FISCAL YEAR FOR WHICH NUMBERS OF ',SHIP,'S HAVE TO BE CHANGED.' ◇ ZERO
[3]   →PERM×⍳0=FY←1↑,⎕ ◇ →ERR1×⍳0=FYAV CHECK FY←FY+1900×100>FY
[4]  DISP:LF;'CURRENT NUMBERS OF ',SHIP,'S FOR FY ',(⍕FY),' WILL BE SHOWN FOR SEVERAL ',SHIP,'TYPES AT A TIME.'
[5]   'THEN YOU WILL BE ASKED TO GIVE NEW NUMBERS OF ',SHIP,'S FOR SAME ',SHIP,'TYPES.' ◇ LF
[6]   SHP←SHP ◇ PP←P ◇ NEWP←0⍴0 ◇ J←0
[7]  LOOP:SPC←4++/' '≠SHP←(J,0)↓SHP ◇ PP←(J,0)↓PP ◇ J←15⌊+/80≥(PARSUM SPC) ◇ FSTR←(FSTR≠' ')/FSTR←1↓,((J,2)⍴',I'),⍕(J,1)⍴SPC
[8]   TITLE←FSTR CENTER 'CURRENT NUMBERS OF ',SHIP,'S' ◇ HEAD←FSTR COLNAMES(INVROWNAMES(J,1↓⍴SHP)↑SHP)
[9]   TABLE←FSTR ⎕FMT OP←⍉(J,1)↑PP[;IP←,+/(⍳⍴FYP)×FYP=FY] ◇ LF;TITLE;HEAD;TABLE;LF
[10] INPUT:'TO GIVE NEW NUMBERS TYPE ',(⍕J),' NUMBERS (SEPARATED BY BLANK SPACES)!'
[11]  'PRESS ''RETURN'' TO HAVE ALL ABOVE ENTRIES UNCHANGED.'
[12]  →CAT×⍳0=⍴NP←⎕FI,⍞ ◇ →ERR×⍳J≠⍴NP ◇ →ERR×⍳∨/0=((0,⍳100+⌈/+/P) CHECK NP)
[13] CAT:NP←NP,(J-(⍴NP))⍴OP ◇ NEWP←NEWP,NP ◇ →LOOP×⍳80<+/SPC ◇ P[;IP]←NEWP ◇ →START
[14] PERM:→EXIT RESPOND 'DO YOU WANT TO MAKE ALL THESE CHANGES PERMANENT'
[15]  →EXIT RESPOND 'ARE YOU REALLY SURE YOU WANT TO ALTER THE PERMANENT FILE'
[16]  P ⎕FREPLACE FNUM,3 ◇ 'FILE HAS BEEN ALTERED!' ◇ →0
[17] ERR1:→START ERRMESSAGE 'YEAR REQUESTED IS NOT AVAILABLE. AVAILABLE YEARS ARE:  ',⍕FYAV
[18] ERR:→INPUT ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
[19] EXIT:LF ◇ 'NO ALTERATION HAS BEEN MADE IN THE FILE.'

      ∇RESULTS[⎕]∇
    ∇ RESULTS;V;W;R;S;O
[1]  ⍝THIS FN COMPUTES BILLET REQUIREMENTS AND OFFICER SUPPLIES FOR EACH TOUR AND FISCAL YEAR.
[2]  ⍝THEN IT COMPUTES THE RATIO OF THE TWO QUANTITIES.
[3]  ⍝THE SAME QUANTITIES ARE ALSO COMPUTED FOR 5-YEAR MOVING AVERAGES IF AVAILABLE. ALL RESULTS ARE DISPLAYABLE.
[4]   R←BW REQU P[;INDP] ◇ V←TOURS[2;] BILLRATES R ◇ S←SUPPL INV[INDO;;] ◇ O←R DIV S ◇ →DISP×⍳5>⍴FYAV
[5]   R←5 MOVINGAVRG R ◇ V←5 MOVINGAVRG V ◇ S←5 MOVINGAVRG S ◇ O←R DIV S
[6]  DISP:O←(O×O≤1.004999999)+(¯1+1 DIV O)×O>1.004999999 ◇ ⍝1.004999999 IS THE LARGEST NUMBER THE COMPUTER ROUNDS TO 1.00.
[7]   DISPRESULTS
    ∇
      ∇REQU[⎕]∇
    ∇ R←B REQU P;RAD
[1]  ⍝THIS FN COMPUTES BILLET REQUIREMENTS FROM THE SHIP TYPE MATRIX AND THE BILLET STRUCTURE MATRIX:
[2]   R←(⍉B)+.×P ◇ →ZL×⍳FNUM≠1110
[3]  ⍝1110 BILLET REQUIREMENTS FOR TOURS A1 AND A2 (AND FOR D1 AND D2) ARE COMPUTED SEPARATELY FROM THAT OF TOUR A (AND TOUR D)
[4]  ⍝USING BILLET REQUIREMENTS FOR TOUR B.(AND TOUR E):
[5]   RAD←R[1 3 ;] ◇ R[1 3 ;]←RAD⌊R[2 4 ;]×⍉((1↓⍴R),2)⍴TOURS[2; 1 4] DIV TOURS[2; 3 6] ◇ RAD←RAD-R[1 3 ;]
[6]   R←R[1;],[1] RAD[1;],[1] R[2 3 ;],[1] RAD[2;],[1] R[3+⍳10;]
[7]  ⍝FINALLY IT ASSIGNS ZERO REQUIREMENTS TO A TOUR OF ZERO LENGTH:
[8]  ZL:R←R×⍉(⌽⍴R)⍴0≠TOURS[2;]
    ∇
      ∇BILLRATES[⎕]∇
    ∇ V←LENGTH BILLRATES R;LY
[1]  ⍝THIS FN COMPUTES BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS) FOR EACH TOUR.
[2]   V←R DIV⍉(⌽⍴R)⍴LENGTH
    ∇
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      ∇SUPPL[⎕]∇
    ∇ S←SUPPL INV;T;LY;GG;SG;VA;CG
[1]   ⍝THIS FN COMPUTES THE MATRIX OF ELIGIBLE OFFICERS.
[2]    T←N COMPTPIC TOURS
[3]    S←(Z,0)⍴LY←1
[4]   LOOPY:SG←(Z,0)⍴GG←1
[5]   LOOPG:CG←(T×(N,Z)⍴VA) DIV(⍉(Z,N)⍴(T>0)+.×VA←A[;GG]×V[;LY])
[6]    SG←SG,INV[LY;;GG]+.×CG ⋄ →LOOPG×⍳G≥GG←GG+1
[7]    S←S,+/A×SG ⋄ →LOOPY×⍳(1↑⍴INV)≥LY←LY+1
    ∇
      ∇DIV[⎕]∇
    ∇ R←NUM DIV DENOM;U
[1]   ⍝THIS FN DIFFERS FROM THE STANDARD OPERATION '÷' IN THAT A÷0=0 FOR ANY A.
[2]    R←(⍴DENOM)⍴U\(U/,NUM)÷(U←0≠,DENOM)/,DENOM
    ∇
      ∇MOVINGAVRG[⎕]∇
    ∇ MA←Y MOVINGAVRG M;I
[1]   ⍝THIS FN COMPUTES MOVING AVERAGES OF EVERY Y CONSECUTIVE COLUMNS OF THE MATRIX 'M'.
[2]   ⍝THE RESULTANT MATRIX 'MA' CONSISTS OF THE MATRIX 'M' CATENATED WITH ADDITIONAL COLUMS OF AVERAGES.
[3]    MA←M ⋄ I←0
[4]   LOOP:MA←MA,(+/((1↑⍴M),Y)↑(0,I)↓M)÷Y ⋄ →LOOP×⍳(I←I+1)≤(1↓⍴M)-Y
    ∇
      ∇DISPRESULTS[⎕]∇
    ∇ DISPRESULTS;NY;YEARS;FSTR;HEAD
[1]   ⍝THIS FN DISPLAYS RESULTS:
[2]   ⍝ 1.REQUIREMENTS= NO. OF BILLETS TO BE FILLED IN EACH SEATOUR AND FISCAL YEAR.
[3]   ⍝ 2.SUPPLY= NO. OF OFFICERS AVAILABLE FOR EACH SEATOUR AND FISCAL YEAR.
[4]   ⍝ 3.SEATOUR OPPORTUNITY= THE RATIO OF REQUIREMENTS TO SUPPLY FOR EACH SEATOUR AND FISCAL YEAR.
[5]   ⍝ 4.BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS) FOR EACH SEATOUR AND FISCAL YEAR.
[6]    NY←0⌈¯4+⍴FYAV ⋄ YEARS←,((NY,1)⍴','),(0 1 ↓⍕(NY,1)⍴FYAV),((NY,1)⍴'-'),(NY,¯2)↑⍕(NY,1)⍴4↓FYAV
[7]    YEARS←(⍳0) ROWNAMES(',' CODIFY FYAV),YEARS ⋄ FSTR←(⍕1↑⍴YEARS),'A1,',(⍕Z),'BI5' ⋄ HEAD←FSTR COLNAMESANDLINE ',YEAR',TRC
[8]   ST:LF ⋄ DISPRESULTSTEXT ⋄ LF ⋄ →(R1,R2,R3,R4,ERR) ROUTING ⎕
[9]   R1:DISPBILL R ⋄ →ST
[10]  R2:DISPOFF S ⋄ →ST
[11]  R3:DISPOPORT O ⋄ →ST
[12]  R4:BILLRATESLIST V ⋄ →ST
[13]  ERR:→ST ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
      ∇DISPRESULTSTEXT[⎕]∇
    ∇ DISPRESULTSTEXT
[1]    →SHORT×⍳SF[4]≥1
[2]    LF;'THE FOLLOWING RESULTS MAY BE DISPLAYED BY TYPING THE APPROPRIATE NUMBER:';LF
[3]    '0. DONE WITH DISPLAYING RESULTS                          TYPE 0'
[4]    '1. BILLET REQUIREMENTS FOR EACH TOUR AND FISCAL YEAR     TYPE 1'
[5]    '2. SUPPLY OF ELIGIBLE OFFICERS FOR EACH TOUR AND FY      TYPE 2'
[6]    '3. SEATOUR OPPRTUNITY (SHORTFALL) FOR EACH TOUR AND FY   TYPE 3'
[7]    '4. BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS)   TYPE 4'
[8]    LF ⋄ SF[4]←SF[4]+1 ⋄ →0
[9]   SHORT:'RESULT OPTIONS: DONE-0/REQUIREMENTS-1/SUPPLY-2/OPPORTUNITY-3/BILLET RATES-4'
[10]   'TYPE ONE OF THE NUMBERS LISTED ABOVE!'
    ∇
      ∇DISPBILL[⎕]∇
    ∇ DISPBILL R;TITLE;TABLE
[1]   ⍝THIS FN DISPLAYS NO. OF BILLETS TO BE FILLED IN FISCAL YEARS REQUESTED.
[2]    TITLE←FSTR CENTERANDLINE 'NUMBER OF ',FNAME,' SEA BILLETS'
[3]    TABLE←FSTR ⎕FMT(YEARS;⍉R) ⋄ TITLE;HEAD;TABLE
    ∇
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      ∇DISPOFF[⎕]∇
    ∇ DISPOFF S;TITLE;TABLE
[1]   ⍝THIS FN DISPLAYS NO. OF OFFICERS AVAILABLE FOR EACH SEA TOUR AND FISCAL YEAR REQUESTED.
[2]    TITLE←FSTR CENTERANDLINE 'NUMBER OF ',FNAME,' OFFICERS'
[3]    TABLE←FSTR ⎕FMT(YEARS;⍉S) ◊ TITLE;HEAD;TABLE
    ∇
      ∇DISPOPORT[⎕]∇
    ∇ DISPOPORT O;FSTR;TITLE;TABLE
[1]   ⍝THIS FN DISPLAYS THE SEA TOUR OPPORTUNITIES FOR EACH SEA TOUR AND FISCAL YEAR REQUESTED.
[2]    FSTR←(⍕1↓⍴YEARS),'A1,',(⍕Z),' P<> Q<> M<(> N<)> BI5'
[3]    TITLE←FSTR CENTERANDLINE 'SEATOUR OPPORTUNITY (SHORTFALL) OF ELIGIBLE ',FNAME,' OFFICERS IN PERCENTAGE'
[4]    TABLE←FSTR ⎕FMT(YEARS;100×⍉O) ◊ TITLE;HEAD;TABLE;LF
    ∇
      ∇BILLRATESLIST[⎕]∇
    ∇ BILLRATESLIST V;TITLE;HEAD;TABLE
[1]   ⍝ THIS FN DISPLAYS THE BILLET RATES (REQUIREMENTS DIVIDED BY TOUR LENGTHS) FOR ALL YEARS.
[2]    TITLE←FSTR CENTERANDLINE 'BILLET RATE (REQUIREMENT DIVIDED BY TOUR LENGTH) FOR ',FNAME,' OFFICERS'
[3]    HEAD←FSTR COLNAMESANDLINE ' ,YEAR',TRC
[4]    TABLE←FSTR ⎕FMT(YEARS;⍉V) ◊ LF;TITLE;HEAD;TABLE;LF
    ∇
      ∇BILLMATRSEL[⎕]∇
    ∇ BT←CH BILLMATRSEL FNAME;T1;T2;T3;D;ND
[1]   ⍝THIS FN ALLOWS THE USER TO SELECT THE DESIRED BILLET MATRIX IN THE AVIATION COMMUNITIES.
[2]   ⍝IN THE SURFACE COMMUNITY IT MAKES SOME MINOR CHANGES IN THE TOUR CODES FOR PROPER DISPLAY IN THE BILLET MATRIX.
[3]    →SHORT×⍳FNUM≠1110 ◊ TRCM← 2 5 REMOVENAMES TRC ◊ TRCM← 1 3 REPLNAMES TRCM ◊ CT←FNAME ◊ →BT←0
[4]   SHORT:FNAME←(T1←FNAME),(0⌈(1↓⍴FNMS)-⍴FNAME)⍴' ' ◊ T2←(T2≠'Δ')/T2←4↑FNAME ◊ T3←(T3≠'Δ')/T3←(T3≠' ')/T3←¯6↑FNAME
[5]    'BILLET MATRIX OPTIONS:  ',T1,'-1 /',T2,'-2 /',T3,'-3 /AVIATION-4 /APPORTIONED-5'
[6]    CT←',',D,T1,ND,T2,ND,T3,(ND←',NON-',(D←'DISCRETE ')),'AVIATION,APPORTIONED ',FNAME
[7]    CT←(⍳0) ROWNAMES CT
[8]    →ERR×⍳0=CH CHECK BT←1↑,⎕
[9]    CT←,CT[BT;] ◊ CT←' *' REPLSINGSYMB CT ◊ CT←REMOVEBLANKS CT ◊ CT←'* ' REPLSINGSYMB CT
[10]   BT←Z×¯1+BT ◊ TRCM←TRC ◊ →0
[11]  ERR:→SHORT ERRMESSAGE 'INPUT ERROR. TRY AGAIN!'
    ∇
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THE FOLLOWING AUXILIARY FUNCTIONS ARE ALSO USED IN THE PROGRAM:

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      ∇CHECK[⎕]∇
    ∇ ACP←POSSIBLE CHECK INPUT
[1]   ⍝THIS FN CHECKS EVERY COMPONENT OF 'INPUT' AGAINST THE VECTOR 'POSSIBLE'.
[2]   ⍝THE RESULT 'ACP' IS A VECTOR OF AS MANY COMPONENTS (0'S AND 1'S) AS THE NUMBER OF ELEMENTS IN 'INPUT'.
[3]   ⍝EACH 1 (OR 0) IN 'ACP' INDICATES THAT THE CORRESP. ELEMENT OF 'INPUT' IS (OR IS NOT) ONE OF THE COMPONENTS OF 'POSSIBLE'.
[4]    ACP←∨/POSSIBLE∘.=,INPUT
    ∇
      ∇REMOVENAMES[⎕]∇
    ∇ NEW←NMBRS REMOVENAMES OLD;NR;I
[1]   ⍝THIS FN REMOVES SOME NAMES FROM A CHARACTER SEQUENCE OF NAMES SEPARATED BY COMMON SYMBOL.
[2]   ⍝E.G. IT CAN REMOVE NAMES OF SHIP TYPES FROM 'SHP' (COMP 1) OR NAMES OF TOURS FROM 'TRN' (COMP 3), ETC.
[3]   ⍝'NMBRS' SHOULD CONTAIN THE NUMBERS OF THE SHIP TYPES TO BE REMOVED.
[4]   ⍝MAKE SURE THE SYMBOL '*' DOES NOT OCCUR IN THE SEQUENCE OF NAMES. IF IT DOES REPLACE '*' BY SOME OTHER SYMBOL IN LINES 5.8.
[5]    NR←ρ('.'=OLD)/OLD←' *' SUBST OLD ◇ NEW←(NR,20) ROWNAMES OLD ◇ I←1
[6]   LOOP:NEW←(-(,NMBRS)[I]-I)⌽[1] 1 0 ↓((,NMBRS)[I]-I)⌽[1] NEW ◇ →LOOP×⍳(ρ,NMBRS)≥I←I+1
[7]    NEW←(((1↑ρNEW),1)ρ'.'),NEW ◇ NEW←(' '≠NEW)/NEW←,NEW
[8]    NEW←'* ' SUBST NEW
    ∇
      ∇REPLNAMES[⎕]∇
    ∇ NEW←NMBRS REPLNAMES OLD
[1]   ⍝THIS FN IS A REVISED VERSION OF THE FN 'REPLACENAMES'. ITS SOLE PURPOSE IS TO REPLACE SOME TOURCODES IN 'TRC'.
[2]    NEW←0 ROWNAMES OLD ◇ NEW[,NMBRS;]←(ρNEW[,NMBRS;]) ROWNAMES '.A.D'
[3]    NEW←(((1↑ρNEW),1)ρ'.'),NEW ◇ NEW←(' '≠NEW)/NEW←,NEW
    ∇
      ∇REMOVEBLANKS[⎕]∇
    ∇ CLEAN←REMOVEBLANKS CV;NB
[1]   ⍝THIS FN REMOVES ALL BLANKS IN THE CHARACTER VECTOR 'CV'.
[2]    CV←' ',CV ◇ NB←CV≠' ' ◇ CLEAN←NB/CV
    ∇
      ∇SUBST[⎕]∇
    ∇ NEWCODE←SWITCH SUBST CODE;IND
[1]   ⍝THIS FN CAN SUBSTITUTE ONE CHARACTER FOR ANOTHER IN A CODE SUCH AS SHIPNAMES OR TOURCODES, ETC.
[2]   ⍝'CODE' IS THE CHARACTER VECTOR IN WHICH THE SUBSTITUTION IS TO BE MADE.
[3]   ⍝'SWITCH' SHOULD CONSIST OF TWO COMPONENTS: SWITCH[1] THE OLD AND SWITCH[2] THE NEW CHARACTER.
[4]    IND←(IND≠0)/IND←IND×⍳ρIND←(1↑SWITCH)=CODE ◇ CODE[IND]←¯1↑SWITCH ◇ NEWCODE←CODE
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      ∇RESPOND[⎕]∇
    ∇ GO←PLACE RESPOND QUEST;YN;ANS;I
[1]   ⍝THIS FN CAN POSE QUESTIONS TO THE USER AND DEMAND A 'YES' OR 'NO' ANSWER.
[2]   ⍝THEN IT ROUTES THE PROGRAM TO THE APPROPRIATE LINE DEPENDING ON THE ANSWER.
[3]    LF ◇ QUEST,'?    ',YN←'ANSWER YES OR N (NO)!' ◇ ANS←(⍴'YES')⍴⍞,'N'
[4]    GO←(0≠+/∧/(ANS∘.='YES')≠I←(I∘.=I+⍳3))⍴PLACE
    ∇
      ∇ROUTING[⎕]∇
    ∇ ROUTE←ROUTES ROUTING C;CHOICES
[1]   ⍝THIS FN IS A SUBROUTINE THAT ENABLES A PROGRAM TO BE ROUTED TO THE APPROPRIATE LINE AS PROMPTED BY THE USER.
[2]   ⍝'ROUTES' SHOULD BE A SEQUENCE OF OF ADDRESSES OF LINES TO WHICH THE PROGRAM MAY BE ROUTED.
[3]   ⍝THE LAST COMPONENT OF 'ROUTES' SHOULD BE THE ADDRESS OF AN ERROR MESSAGE FOR INAPPROPRIATE  USER INPUT.
[4]   ⍝THE OTHER ARGUMENT 'C' SHOULD BE THE ⎕ SYMBOL TO ENABLE THE USER TO MAKE HIS CHOICE.
[5]    →ROUTE×⍳(ROUTE←C←,(,C)[1])=0
[6]    ROUTE←(¯1↓,ROUTES)×0≠+/CHOICES×C=CHOICES←⍳⍴¯1↓ROUTES ◇ →0×⍳ROUTE≠¯1↑,ROUTES
[7]    ROUTE←(C=⍳⍴ROUTES)/ROUTES←¯1↓,ROUTES
    ∇
      ∇ERRMESSAGE[⎕]∇
    ∇ DESTIN←PLACE ERRMESSAGE MESSAGE
[1]   ⍝THIS FN DISPLAYS A MESSAGE AND DEFINES A DESTINATION WHERE THE PROGRAM CAN BE ROUTED.
[2]    ⍞←MESSAGE ◇ DESTIN←PLACE
    ∇
      ∇CENTERANDLINE[⎕]∇
    ∇ TTL←FSTR CENTERANDLINE TITLE
[1]   ⍝THIS FN CENTERS AND UNDERLINES A TITLE USING A FORMATSTRING.
[2]    TITLE←FSTR CENTER TITLE
[3]    TTL←TITLE,[1] FSTR CENTER(' '≠,TITLE)\'¯'
    ∇
      ∇COLNAMESANDLINE[⎕]∇
    ∇ HEAD←FSTR COLNAMESANDLINE NAMES
[1]   ⍝THIS FN FORMS COLUMN HEADINGS AND UNDERLINES THEM USING A FORMATSTRING.
[2]   ⍝'NAMES' IS A CHARACTER VECTOR. IT SHOULD CONTAIN THE COLUMN HEADINGS SEPARATED BY COMMON SYMBOL (E.G. COMMA).
[3]   ⍝FIRST CHARACTER MUST BE THE COMMON SYMBOL (E.G. COMMA).
[4]    HEAD←FSTR COLNAMES NAMES ◇ NAMES←' *' REPLSINGSYMB NAMES
[5]    NAMES←(⍳0) ROWNAMES NAMES ◇ NAMES←(⍴NAMES)⍴(' '≠,NAMES)\'¯' ◇ NAMES←(((1↑⍴NAMES),1)⍴','),NAMES
[6]    HEAD←HEAD,[1] FSTR COLNAMES NAMES←(' '≠,NAMES)/,NAMES
    ∇
      ∇REPLSINGSYMB[⎕]∇
    ∇ NEWCV←S REPLSINGSYMB CV;IND;FS
[1]   ⍝THIS FN REPLACES ISOLATED SYMBOLS (I.E. WHOSE ADJACENT SYMBOLS ARE NOT THE SAME) WITH ANOTHER SYMBOL.
[2]   ⍝THE ARGUMENT 'S' SHOULD BE A CHARACTER VECTOR WHOSE FIRST COMPONENT IS THE CHARACTER TO BE REPLACED WITH THE LAST ONE
[3]   ⍝IN THE CHARACTER VECTOR 'CV'.  NOTE THAT MULTIPLE OCCURRENCES OF A SYMBOL ARE LEFT IN 'CV'.
[4]    IND←(IND≠0)/IND←IND×⍳⍴IND←(FS=CV)∧(FS≠1⌽CV)∧(FS←1↑,S)≠¯1⌽CV ◇ CV[IND]←¯1↑,S ◇ NEWCV←CV
    ∇
      ∇CODIFY[⎕]∇
    ∇ CODE←S CODIFY NUMBERS;NN
[1]   ⍝THIS FN CONVERTS THE NUMERICAL VECTOR 'NUMBERS' INTO A SEQUENCE OF CHARACTERS.
[2]   ⍝THE COMPONENTS OF 'NUMBERS' WILL BE SEPERATED BY THE SYMBOL 'S' WHICH SOULD BE A CHARACTER INPUT.
[3]   ⍝THE FIRST CHARACTER OF 'CODE' WILL BE THE SYMBOL 'S'.
[4]    CODE←,(NN⍴S),(0 1)↓⍕((NN←⍴,NUMBERS),1)⍴NUMBERS
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THE FOLLOWING SCIENTIFIC TIME SHARING CORPORATION FORMATTING FUNCTIONS
ARE UTILIZED BY THE AIRTOURS PROGRAM:

⎕FMT
ROWNAMES
COLNAMES

THE SPECIFIC DETAILS OF THESE FUNCTIONS MAY BE FOUND BY ACCESSING THE
SCIENTIFIC TIME SHARING CORP. SYSTEM.
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